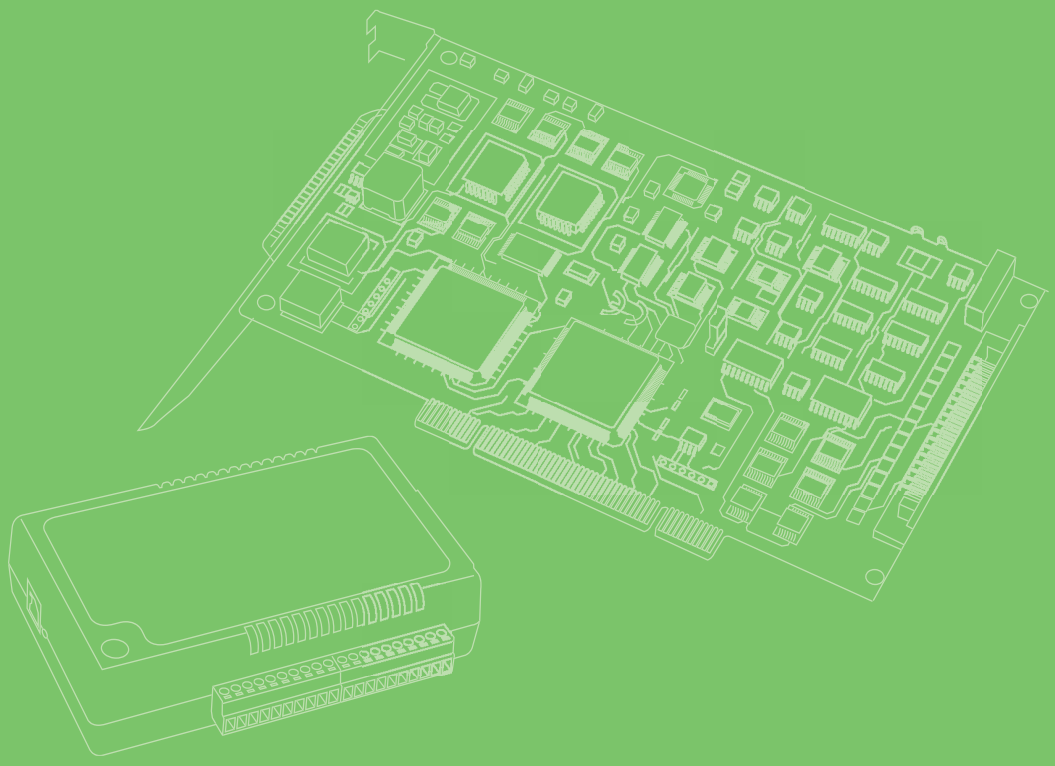


User Manual

# AMAX-4800 Series

## Industrial EtherCAT Slave Modules

ADVANTECH

*Enabling an Intelligent Planet*

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This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

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1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any relevant information readily available.
3. If your product is diagnosed as defective, obtain a return merchandize authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and proof of the purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside and then ship the package prepaid to your dealer.

Part No.2001483014 Edition 5

Printed in Taiwan February 2020

# Declaration of Conformity

### CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This type of cable is available from Advantech. Please contact your local supplier for more information.

### FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In such cases, users are required to correct the interference at their own expense.

# Technical Support and Assistance

1. Visit the Advantech website at www.advantech.com/support to obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information to hand before calling:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (OS, version, application software, etc.)
   - Comprehensive description of the problem encountered
   - The exact wording of any error messages

# Safety Precautions - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from the PC chassis before manually handling the product. Do not touch any components on the CPU card or other cards when the PC is powered on.
- Disconnect the power before making any configuration changes. The sudden rush of power after connecting a jumper or installing a card can damage sensitive electronic components.

# Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket should be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place this equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If unused for a long time, disconnect the equipment from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following occurs, have the equipment checked by service personnel:

- The power cord or plug is damaged.
- Liquid has penetrated the equipment.
- The equipment has been exposed to moisture.
- The equipment is malfunctioning, or does not operate according to the user manual.
- The equipment has been dropped and damaged.
- The equipment shows obvious signs of breakage.

15. Do not store the equipment in an environment where the temperature fluctuates below -20 °C (-4 °F) or above 60 °C (140 °F) as this can cause damage. The equipment should be stored in a controlled environment.
16. The battery is at risk of explosion if incorrectly installed or replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
17. According to IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).

DISCLAIMER: These instructions are provided in accordance with IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

# Contents


## Chapter 1 Introduction ..... 1

1.1 EtherCAT Introduction ..... 2
1.1.1 EtherCAT ..... 2
Figure 1.1 EtherCAT Function Principle ..... 2
Figure 1.2 EtherCAT Protocol ..... 3
Figure 1.3 EtherCAT Topology ..... 3
Figure 1.4 EtherCAT Distributed Clock ..... 4
Figure 1.5 EtherCAT Distributed Clock Jitter ..... 5
1.2 AMAX-4800 Series Features ..... 6
1.2.1 EtherCAT Free-Run and Distributed Clock (DC) Modes ..... 6
Figure 1.6 Distributed Clock Unit Interfaces ..... 6
1.2.2 Software Support ..... 7
1.3 Specifications ..... 7
1.3.1 Communication ..... 7
1.3.2 General ..... 7
1.3.3 I/O ..... 8
1.3.4 Power Consumption ..... 9
1.4 Appearance ..... 10
1.4.1 Dimensions ..... 10
Figure 1.7 AMAX-4800 Module Dimensions ..... 10
Figure 1.8 AMAX-4800 Appearance ..... 11
1.4.2 LED Indicator ..... 11
Figure 1.9 LED Indicator Flash Rates ..... 12
1.4.3 LAN Connector ..... 12
1.4.4 Rotate Switch ..... 13
1.4.5 Power ..... 13

## Chapter 2 Signal Connections ..... 15

2.1 Overview ..... 16
2.2 Pin Assignment ..... 16
2.2.1 AMAX-4817 Pin Assignment ..... 16
2.2.2 AMAX-4820 Pin Assignment ..... 16
2.2.3 AMAX-4830/SO Pin Assignment ..... 17
2.2.4 AMAX-4833 Pin Assignment ..... 17
2.2.5 AMAX-4834 Pin Assignment ..... 18
2.2.6 AMAX-4850 Pin Assignment ..... 18
2.2.7 AMAX-4855 Pin Assignment ..... 19
2.2.8 AMAX-4856 Pin Assignment ..... 20
2.2.9 AMAX-4860 Pin Assignment ..... 21
2.2.10 AMAX-4862 Pin Assignment ..... 21
2.3 Connections ..... 22
2.3.1 Isolated DI Connection ..... 22
2.3.2 Isolated Digital Output ..... 22
2.3.3 Relay Output ..... 23
2.3.4 Analog Input Connections ..... 23
2.3.5 Analog Output Connections ..... 24
2.4 Switch ..... 24
2.4.1 AMAX-4830SO ..... 24
2.5 Field Wiring Consideration ..... 25
2.5.1 Cable Length ..... 25
Figure 2.1 Cable mode in ISO/IEC 11801 ..... 25
Figure 2.2 Several possible channel architectures ..... 26
2.5.2 Cable Selection ..... 26

Figure 2.3 Difference between a fixed cable and a flexible cable . 26
Table 2.1: Recommended cable parameters. ..... 26
Figure 2.4 Recommended and discouraged shielding configurations ..... 27
2.5.3 Registered Jack 45 (RJ45) Selection ..... 27
Figure 2.5 Contact plating of the RJ45. ..... 27
Figure 2.6 Gold plate tripod types. ..... 28
Figure 2.7 Shielded RJ45. ..... 28
Figure 2.8 Connect metal shield of RJ45 to drain wire ..... 28
2.5.4 Electromagnetic Protection ..... 29
Figure 2.9 Minimum distance between communication and power cables. ..... 29
Figure 2.10 Minimum distance with metallic separation conduits. ... 29
Figure 2.11 Communication cable and power cable crossing ..... 30
Figure 2.12 Avoid loops in communication cables ..... 30
2.5.5 Earthing and Grounding ..... 30
Figure 2.13 Equipotential earthing scheme ..... 31
Figure 2.14 Star earthing scheme ..... 31
2.5.6 Power Separation ..... 32
Figure 2.15 Power separation. ..... 32
Figure 2.16 Power separation with isolation ..... 33

**Chapter 3 Getting Started ..... 35**

3.1 Introduction ..... 36
3.2 Advantech Common Motion Utility (PCI-1203) ..... 36
3.2.1 Main Form ..... 36
3.2.2 Master Page ..... 37
3.2.3 Module Page ..... 37
3.3 TwinCAT® ..... 38
3.3.1 EtherCAT Slave Information (ESI) Files ..... 38
3.3.2 Main Form ..... 39
3.3.3 Install EtherCAT Driver ..... 39
3.3.4 Scan for AMAX-4800 Series Devices ..... 40
3.3.5 Port Operation ..... 43
3.4 CODESYS ..... 44
3.4.1 Import ESI Files to CODESYS ..... 44
3.4.2 How to Use the AMAX-4800 Series with CODESYS ..... 45
3.5 Module Configuration ..... 46
3.5.1 AMAX-4817: 8-Channel Analog Input Module ..... 46
3.5.2 AMAX-4820: 4-Channel Analog Output Module ..... 48
3.5.3 AMAX-4830/SO: 16-Channel IDI and 16-Channel IDO Module . 52
3.5.4 AMAX-4833: 32-Channel IDI Module ..... 53
3.5.5 AMAX-4834: 32-Channel IDO Module ..... 54
3.5.6 AMAX-4850: 16-Channel IDI and 8-Channel PhotoMOS Output Module ..... 55
3.5.7 AMAX-4855: 32-Channel IDI and 16-Channel PhotoMOS Output Module ..... 56
3.5.8 AMAX-4856: 32-Channel IDI and 32-Channel IDO Module ..... 58
3.5.9 AMAX-4860: 8-Channel IDI and 8-Channel Relay Output Module. 60
3.5.10 AMAX-4862: 16-Channel IDI and 16-Channel Relay Output Module ..... 61

**Appendix A Object Dictionary ..... 63**

A.1 Object Dictionary ..... 64

A.1.1 AMAX-4817 Object Dictionary ..... 64
A.1.2 AMAX-4820 Object Dictionary ..... 68
A.1.3 AMAX-4830/SO Object Dictionary ..... 71
A.1.4 AMAX-4833 Object Dictionary ..... 75
A.1.5 AMAX-4834 Object Dictionary ..... 79
A.1.6 AMAX-4850 Object Dictionary ..... 83
A.1.7 AMAX-4855 Object Dictionary ..... 87
A.1.8 AMAX-4856 Object Dictionary ..... 92
A.1.9 AMAX-4860 Object Dictionary ..... 98
A.1.10 AMAX-4862 Object Dictionary ..... 101

# Chapter 1

## Introduction

# 1.1 EtherCAT Introduction

**EtherCAT (Ethernet Control Automation Technology)** is a high-performance, Ethernet-based fieldbus industrial network system. The protocol is standardized in IEC 61158 and applied to automation applications that require fast and efficient communications. Short data update times with precise synchronization make EtherCAT suitable for real-time automation technology requirements.

## 1.1.1 EtherCAT

### Functional Principle

EtherCAT is a flexible, real-time, high-speed, Ethernet-based protocol. In EtherCAT networks, the master sends Ethernet frames through all the slave nodes. However, standard Ethernet packets or frames are no longer received, interpreted, and copied as process data at every node. Instead, slave devices read the data addressed to them while inserting input data as the telegram passes through the device, effectively processing data immediately. Typically, the entire network can be addressed using a single frame. Compared with other Ethernet-based communication solutions, EtherCAT uses the full available duplex bandwidth more efficiently.

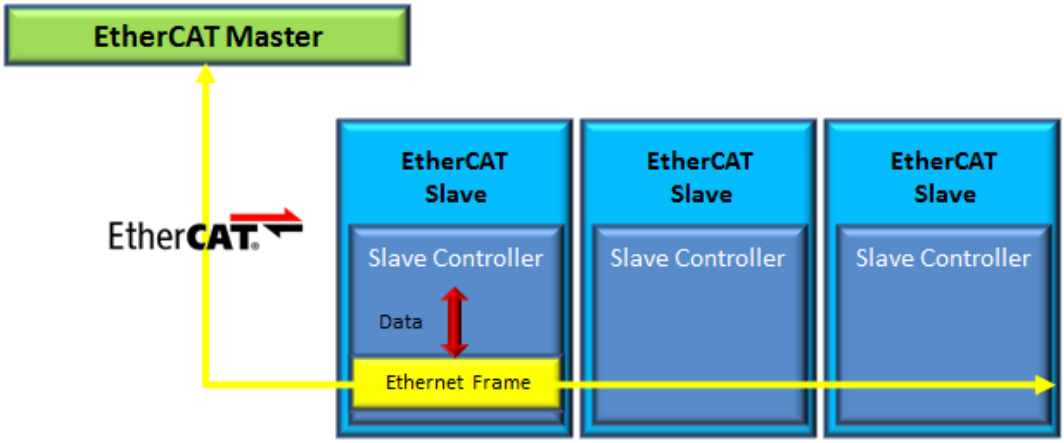



**Figure 1.1 EtherCAT Function Principle**

#### 1.1.1.1 Protocol

Data exchanges are cyclically updated between the EtherCAT master and slaves. Data in EtherCAT frames is transported within the standard IEEE 802.3 Ethernet frame using EtherType 0x88a4 and then processed by the EtherCAT slave controller. Every EtherCAT datagram is a command that consists of a header, data, and a working counter. The datagram header indicates the type of access requested by the master device (see the examples listed below).

- Read, write, read-write
- Access to a specific slave device through direct addressing
- Access to multiple slave devices through logical addressing

Logical addressing is used for the cyclical exchange of process data. The header and data are used to specify the operation that the slave must perform. The working counter is updated by the slave to notify the master that the command has been processed.

Every EtherCAT datagram ends with a 16-bit working counter (WKC). The WKC counts the number of devices successfully addressed by the EtherCAT datagram.

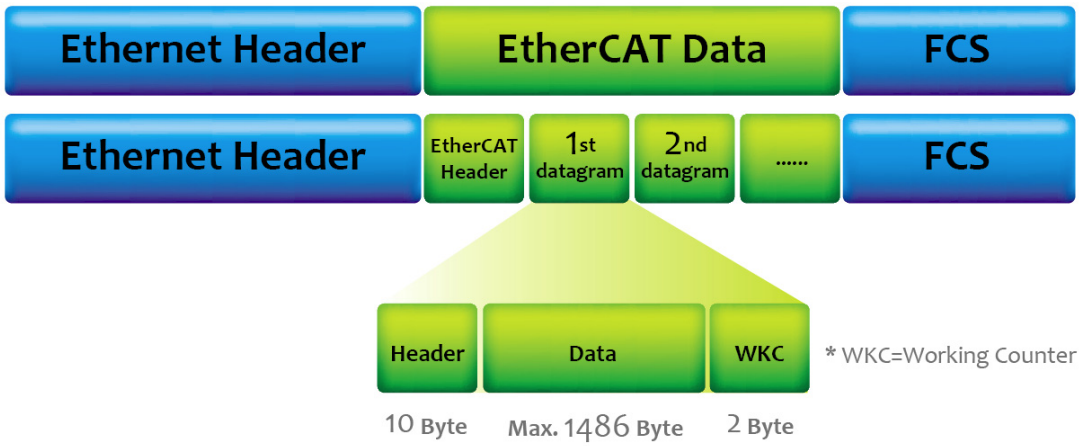



**Figure 1.2 EtherCAT Protocol**

EtherCAT datagrams are processed before the complete frame is received.

Encase the data is invalid, the frame check sum (FCS) is set as “not valid” and the slave does not set the data as “valid” for local applications.

#### 1.1.1.2 Topology

EtherCAT supports various network topologies, including line, tree, ring, and star topologies. The line and tree topologies are more conducive to fieldbus applications because they require fewer connections and use a comparatively simpler and more flexible cabling scheme that does not necessitate switches or hubs.

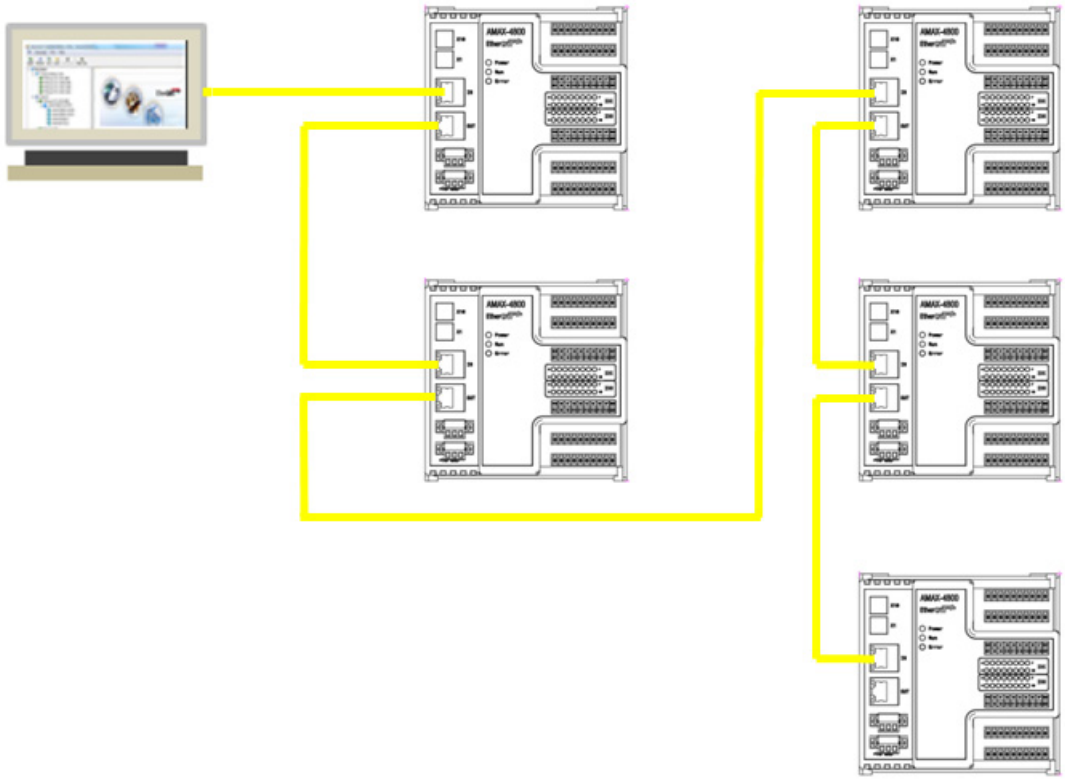


**Figure 1.3 EtherCAT Topology**

Inexpensive industrial Ethernet cables placed up to 100 m apart can be used between two nodes in 100BASE-TX mode. EtherCAT facilitates the creation of a pure bus or line topology with hundreds of nodes. Up to 65,535 devices can be connected to EtherCAT, enabling almost unlimited network expansion.

EtherCAT also supports the connection and disconnection of individual nodes during operation. If one slave in the network is removed, the rest of the network can still operate normally. EtherCAT also enables other communication features, such as cable redundancy or even master redundancy with hot standby.

#### 1.1.1.3 Synchronization

The **distributed clock (DC) mechanism** is used to provide highly precise time synchronization between slaves in an EtherCAT network, equivalent to the IEEE 1588 Precision Time Protocol standard. By using distributed clocks, EtherCAT is able to synchronize the time of all local bus devices within a very narrow tolerance range. All EtherCAT slaves are provided with an internal clock known as “system time” ($t_{Local\ Time}$). One EtherCAT slave, usually the first one, is used as a reference clock and distributes its time cyclically.

Misalignments between the reference clock and the clocks of the other slaves are usually caused by the following: when a slave is switched on, the internal free-running register that holds the current time is reset to zero. Unfortunately, this action does not occur simultaneously in all the slaves, resulting in an initial offset ($t_{Offset}$ ) among the clocks that must be compensated for.

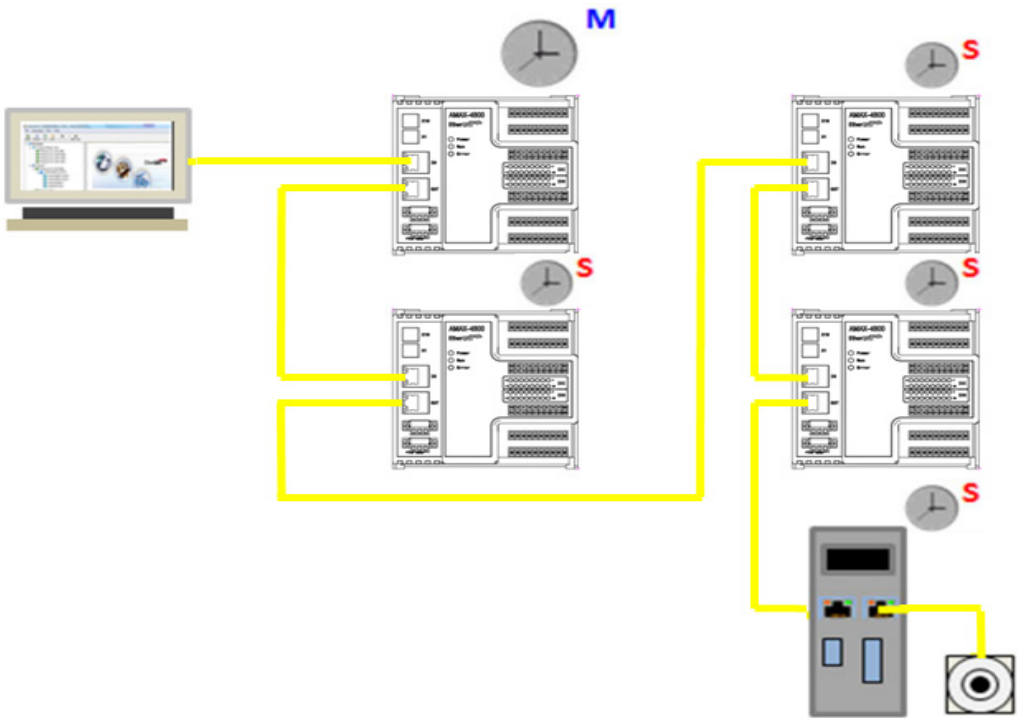



**Figure 1.4 EtherCAT Distributed Clock**

Typically, the master sends a broadcast to all slaves in the system. Upon receiving the message, all slaves latch the value of their internal clock. There are two latch values – receiving and returning. Thus, the master can read all latched values and calculate the delay for each slave ($t_{Propagation\ Delay}$). Delays are stored in the offset register. Subsequently, the master periodically sends a message to all other slaves in the EtherCAT network declaring the first slave the reference clock and instructing all other slaves to set their internal clock according to the calculated offset.

$$\Delta t = (t_{Local\ Time} + t_{Offset} - t_{Propagation\ Delay}) - t_{Received\ System\ Time}$$

Because slave synchronization in DC mode is performed by the hardware's internal clock, EtherCAT guarantees a time jitter of less than 1 us.

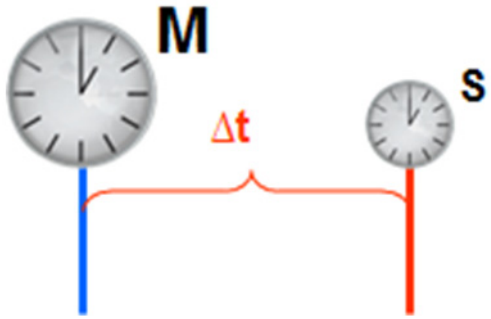



**Figure 1.5 EtherCAT Distributed Clock Jitter**

#### 1.1.1.4 Diagnosis with Exact Localization

EtherCAT is an ultra-fast I/O system. To achieve optimal high-speed communication, communication accuracy is required. EtherCAT comprises a wide range of system-specific diagnostic features for precisely detecting and locating system errors. Besides broken wire detection and localization, the protocol, physical layer, and topology of the EtherCAT system enable quality monitoring of each individual transmission segment.

As mentioned previously, every EtherCAT datagram ends with a 16-bit WKC for counting the number of devices successfully addressed by the EtherCAT datagram. The master can check the data exchange situation through the WKC in the cycle and detect the error frame by analyzing the nodes' error counters. The slave application is only executed when the frame is correctly received. The automatic evaluation of the associated error counters enables precise localization of critical network sections.

Bit errors during transmission can be reliably identified by analyzing the cyclic redundancy check (CRC) check sum. CRC is an error-detecting code commonly used in digital networks and storage devices to detect accidental changes to raw data. In addition to the error detection and localization protocol, the transmission physics and topology of the EtherCAT system allow quality monitoring of every single transmission path. Overall, EtherCAT features a very effective monitoring mechanism.

## 1.2 AMAX-4800 Series Features

The AMAX-4800 series comprises industrial EtherCAT slave modules equipped with the EtherCAT protocol. The modules' compact size and integrated DIN rail mount kit enable easy installation in cabinets. Euro-type pluggable terminal blocks and LED indicators assist users with system setup and maintenance. All modules are protected by an isolation circuit, making them suitable for demanding industrial applications.

### 1.2.1 EtherCAT Free-Run and Distributed Clock (DC) Modes

EtherCAT telegrams are sent by the EtherCAT master to all connected EtherCAT slaves, which perform continually synchronous/asynchronous sequences of calculations and/or data copying actions. EtherCAT has two data transfer modes – Free Run mode and DC mode.

**Free Run Mode**

In Free Run mode, the local cycle is triggered via a local timer interrupt, and the cycle time can be modified by the master (optional) to change the timer interrupt. The local cycle operates independent of the communication cycle, and the slave refreshes I/O data asynchronous to the master.

**DC Mode**

In DC mode, the slave refreshes I/O data in synchronization with the master's communication cycle. A mechanism known as a distributed clock (DC) is applied to timing signals generated independent of the communication cycle for precise timing requirements. The DC is shared to synchronize the master and the slaves. Interruptions (Sync0) are generated in the slaves at precise intervals based on this clock. Each slave executes I/O processing at this exact time. This means that all EtherCAT devices can share the same EtherCAT system time (global time base) for synchronization.

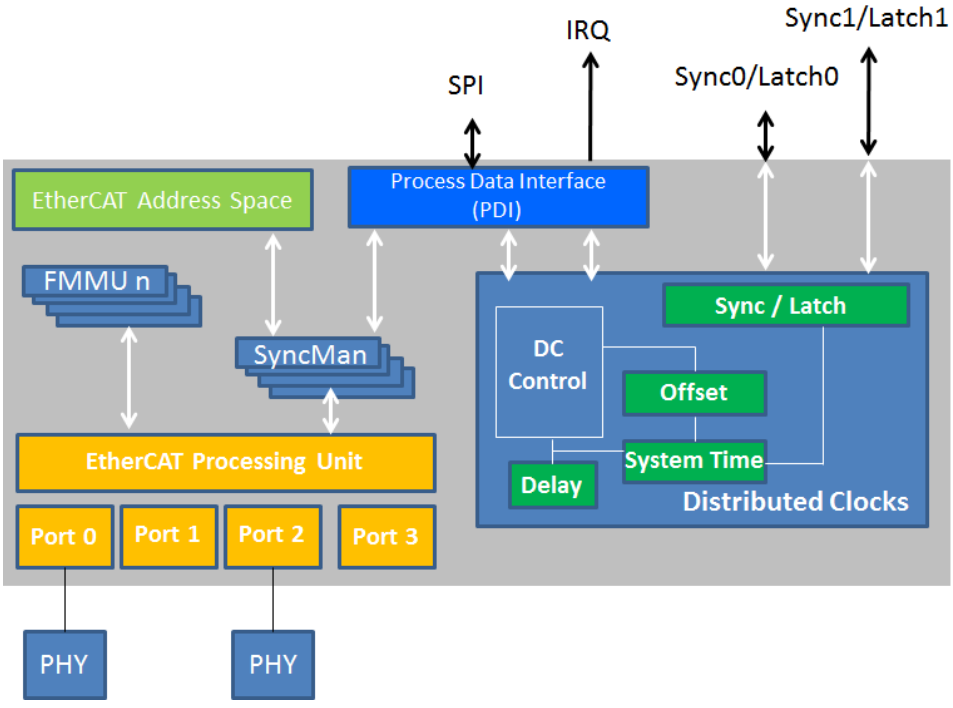



**Figure 1.6 Distributed Clock Unit Interfaces**

### 1.2.2 Software Support

Based on the EtherCAT standard, Advantech provides the necessary DLL drivers and Windows utilities to configure the AMAX-4800 series modules, including I/O modules integrated with Windows XP/7/8/10.

Advantech also provides a Common Motion I/O API for users to develop unique applications under a Common Motion architecture in order to unify the user interfaces of all Advantech motion devices.

Users can also configure parameter settings via a third-party EtherCAT master, such as TwinCAT, Codesys, or Aconis, by using the AMAX-4800 series module's ESI file to connect to existing EtherCAT networks.

## 1.3 Specifications

### 1.3.1 Communication

| Item | Description |
|---|---|
| Interface | EtherCAT |
| Data Transfer Medium | Ethernet/EtherCAT cable (min. CAT5), shielded |
| Distance Between modules | Max. 100 m (100BASE-TX) |
| Communication Cycle Time | 100 us |
| Data Transfer Rates | 100 Mbps |

### 1.3.2 General

| Item | Description |
|---|---|
| Connectors | 10-pin terminal block, 3.81 mm *N |
| | 3-pin screw terminal block, 3.81 mm * 2 (power) |
| | RJ-45 * 2 (EtherCAT) |
| Dimensions | 120 x 120 x 40 mm (4.72 x 4.72 x 1.57 in) for AMAX-4817/20/30/33/34/50/60<br>168 x 120 x 40 mm (6.61 x 4.72 x 1.57 in) for AMAX-4855/56/62 |
| Operating Temperature | -20 ~ 60 °C (32 ~ 140 °F) |
| Storage Temperature | -40 ~ 70 °C (-40 ~ 158 °F) |
| Storage Humidity | 5 ~ 95% RH (non-condensing) |
| Power Supply | 10 ~ 30 $V_{DC}$ |
| Certification | CE, FCC Class A |

*N

| | AMAX 4817 | AMAX 4820 | AMAX 4830 | AMAX 4833 | AMAX 4834 | AMAX 4850 | AMAX 4855 | AMAX 4856 | AMAX 4860 | AMAX 4862 |
|---|---|---|---|---|---|---|---|---|---|---|
| N | 2 | 1 | 4 | 4 | 4 | 4 | 8 | 8 | 3 | 6 |

## 1.3.3 I/O

### Channels

| Item | AMAX-4830/SO | AMAX 4833 | AMAX 4834 | AMAX 4850 | AMAX 4855 | AMAX 4856 | AMAX 4860 | AMAX 4862 |
|---|---|---|---|---|---|---|---|---|
| Isolated Digital Input Channels | 16 | 32 | - | 16 | 32 | 32 | 8 | 16 |
| Isolated Digital Output Channels | 16 | - | 32 | - | - | 32 | - | - |
| PhotoMOS Relay Output Channels | - | - | - | 8 | 16 | - | - | - |
| Relay Output Channels | - | - | - | - | - | - | 8 | 16 |

### Isolated Digital Input

| Item | Description |
|---|---|
| Input Voltage | Logic 0: 3 V max. |
| | Logic 1: 10 V min. (30 V max.) |
| Operating Temperature | -20 ~ 60 °C (32 ~ 140 °F) |
| Isolation Protection | 2,500 $V_{DC}$ |

### Isolated Digital Output

| Item | Description |
|---|---|
| Load Voltage | 5 ~ 40 $V_{DC}$ |
| Load Current | 350mA/ch sink or source @ 25 °C |
| | 250mA/ch sink or source @ 60 °C |
| Isolation Protection | 2,500 $V_{DC}$ |
| Opto-Isolator Response Time | 100 µs |

### Relay Output

| Item | Description |
|---|---|
| Relay Type | Form A |
| Contact Rating (Resistive) | 2A@250 $V_{AC}$, 2A@30 $V_{DC}$ |
| Max. Switching Power | 500 $V_{AC}$, 60 W |
| Max. Switching Voltage | 270$V_{AC}$, 125$V_{DC}$ |
| Resistance | 30 mΩ max. |
| Operating Time | 10 ms max. |
| Releasing Time | 5 ms max. |
| Life Expectancy | Mechanical 2 x $10^7$ ops. at no load |
| | Electrical 3 x $10^4$ ops. @2A/250 $V_{AC}$ |

### PhotoMOS Relay Output

| Item | Description |
|---|---|
| Relay Type | PhotoMOS SPST (Form A) |
| Load Voltage | 60 V (AC peak or DC) |
| Load Current | 1.2A |
| Peak Load Current | 4A @100ms (1 pulse) |
| Isolation Protection | 1,500 $V_{DC}$ |
| Turn-On Time | 1 ms typical |
| Turn-Off Time | 0.6 ms typical |

### Analog Input

| Item | Description |
|---|---|
| Channels | 8 (AMAX-4817 only) |
| Resolution | 16 bits |
| Voltage Input Range | 0 ~ 10 V, ±10 V |
| Common-Mode Voltage Range | ±275 V |
| Measurement Error | < ±0.1% of full-scale range |
| Isolation Protection | 2,500 $V_{DC}$ |

### Analog Output

| Item | Description |
|---|---|
| Channels | 4 (AMAX-4820 only) |
| Resolution | 16 bits |
| Voltage Output Range | 0 ~ 5 V, 0 ~ 10 V, ±5 V, ±10 V |
| Current Output Range | 0 ~ 20 mA, 4 ~ 20 mA |
| Load | > 1 kΩ (voltage output)<br>< 625 Ω (current output) |
| Output Error | < ±0.1% of full-scale range |
| Isolation Protection | 2,500 $V_{DC}$ |

## 1.3.4 Power Consumption

| Model | Power Consumption |
|---|---|
| AMAX-4817 | Typ. 160mA @ 24 V; Max. 190mA @ 24 V |
| AMAX-4820 | Typ. 160mA @ 24 V; Max. 190mA @ 24 V |
| AMAX-4830 | Typ. 85mA @ 24 V; Max. 110mA @ 24 V |
| AMAX-4830SO | Typ. 85mA @ 24V; Max. 110mA @24V |
| AMAX-4833 | Typ. 85mA @ 24 V; Max. 110mA @ 24 V |
| AMAX-4834 | Typ. 85mA @ 24 V; Max. 110mA @ 24 V |
| AMAX-4850 | Typ. 85mA @ 24 V; Max. 110mA @ 24 V |
| AMAX-4855 | Typ. 85mA @ 24 V; Max. 130mA @ 24 V |
| AMAX-4856 | Typ. 85mA @ 24 V; Max. 130mA @ 24 V |
| AMAX-4860 | Typ. 85mA @ 24 V; Max. 110mA @ 24 V |
| AMAX-4862 | Typ. 85mA @ 24 V; Max. 110mA @ 24 V |

# 1.4 Appearance

## 1.4.1 Dimensions

The dimensions of the system unit and I/O unit are shown below. All dimensions are in millimeters.

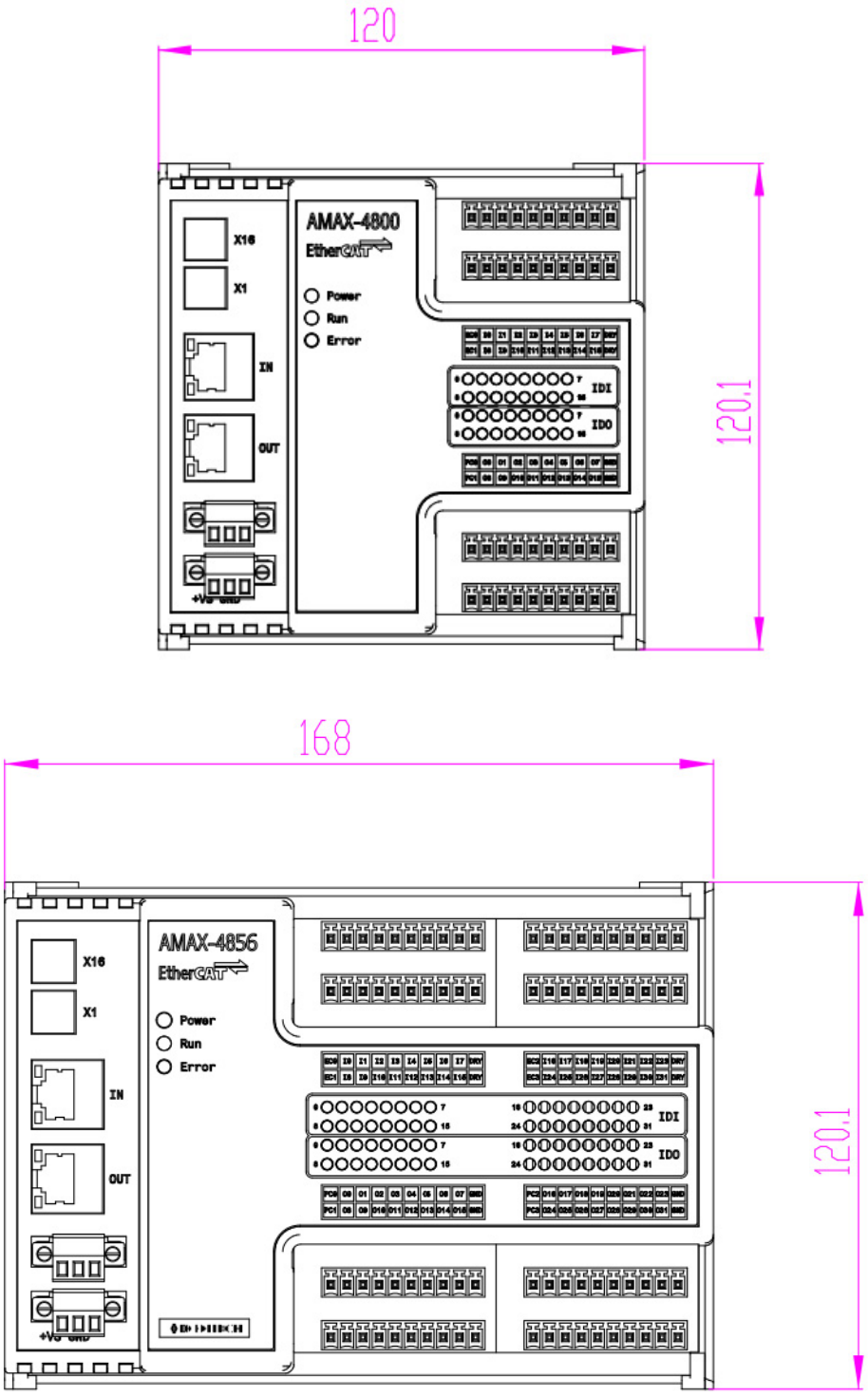



**Figure 1.7 AMAX-4800 Module Dimensions**

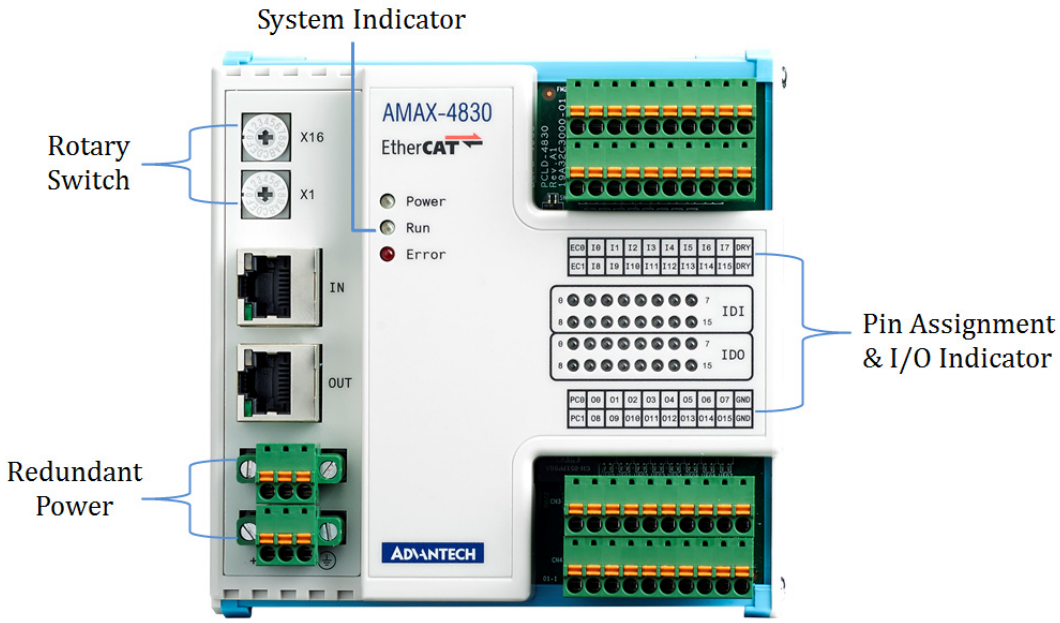



**Figure 1.8 AMAX-4800 Appearance**

## 1.4.2 LED Indicator

System status and I/O indicators are located on the AMAX-4800 front panel. The LED indicator states follow EtherCAT specifications and are explained below.

### 1.4.2.1 LED States

**[Power] Indicator**

| Indicator State | System State | Description |
|---|---|---|
| Off | Power Off | The system power is turned off |
| On | Power On | The system power is turned on |

**[Run] Indicator**

| Indicator State | Slave State | Condition |
|---|---|---|
| Off | Initialization | The device is in the Initialization state. |
| Blinking | Pre-Operational | The device is in the Pre-Operational state |
| Single Flash | Safe Operational | The device is in the Safe Operational state |
| On | Operational | The device is in the Operational state |
| Flickering | Bootstrap | The device is booting and has not yet entered the Initialization state, or the device is in the Bootstrap state. Firmware download operation in progress |

### [Error] Indicator

| Indicator State | Error Name | Description |
|---|---|---|
| Off | No Error | The device is in working condition |
| Blinking | Invalid Configuration | General configuration error |
| Single Flash | Local Error | Slave device application has changed the EtherCAT state autonomously due to local error. The error indicator bit is set to 1 in the AL Status register |
| Double Flash | Watchdog Timeout | An application watchdog timeout has occurred |

### [Link] Indicator (on RJ45)

| Indicator State | Link | Activity | Condition |
|---|---|---|---|
| On | Yes | No | Port open/connected |
| Flickering | Yes | Yes | Port open/connected |
| Off | No | Not applicable | Port closed/disconnected |

#### 1.4.2.2 LED Timing Diagram

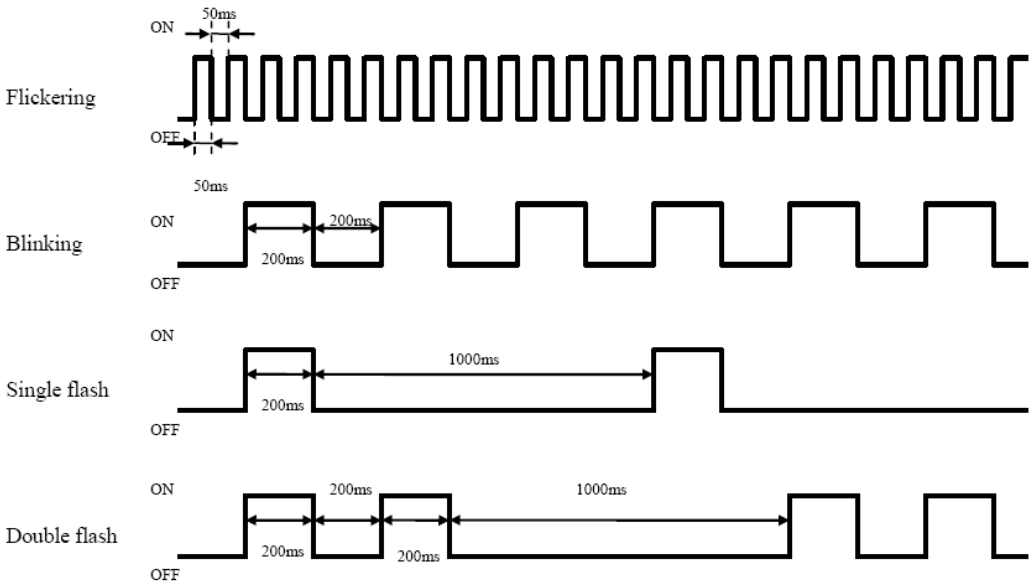


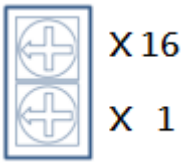

**Figure 1.9 LED Indicator Flash Rates**

## 1.4.3 LAN Connector

Two RJ45 connectors can be set as EtherCAT ports. One connector is the EtherCAT network “IN”, the other is the EtherCAT network “OUT”.

### 1.4.4 Rotate Switch

The AMAX-4800 series modules use two hexadecimal rotate switches to represent the slave ID (range: 0 ~ 255).




For example, if a user arranges the rotate switches according to the sequence “4, F,” the slave ID will be set as “4 x 16 + F x 1= 79”. The default rotary switch is set as zero.

***Note!*** *Slave IDs can be defined in the following two ways:*

*1. If the rotate switch is set as non-zero, the switch defines the slave ID.*

*2. If the rotate switch is set as zero, the slave ID will be defined by EEPROM. The master can be used to change EEPROM’s slave IDs.*

### 1.4.5 Power

AMAX-4800 series modules are equipped with two power input terminals, support an input power voltage of 10 ~ 30 $V_{DC}$, and feature redundant power functionality. With the provision of two power sources, when one source is interrupted, the other source will assume the primary supply function immediately. The AMAX-4800 series can also function with a single power source.

# Chapter 2

## Signal Connections

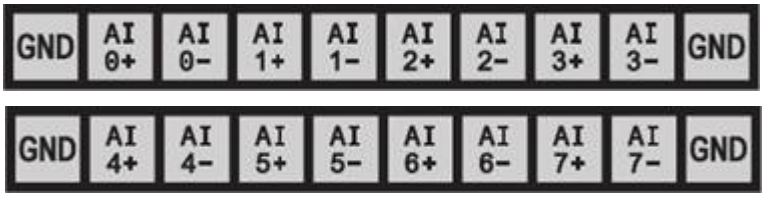
# 2.1 Overview

Maintaining signal connections is crucial to ensuring that the application system is sending and receiving data correctly. A good signal connection can reduce costly damage to hardware devices. This chapter provides useful information regarding connecting input and output signals to the AMAX-4800 series modules via an I/O connector.

# 2.2 Pin Assignment

## 2.2.1 AMAX-4817 Pin Assignment

Analog Input




| Signal Name | Description |
|---|---|
| AI<0 ~ 7>+ | Analog positive input channels 0 through 7 |
| AI<0 ~ 7>- | Analog negative input channels 0 through 7 |
| GND | Ground |

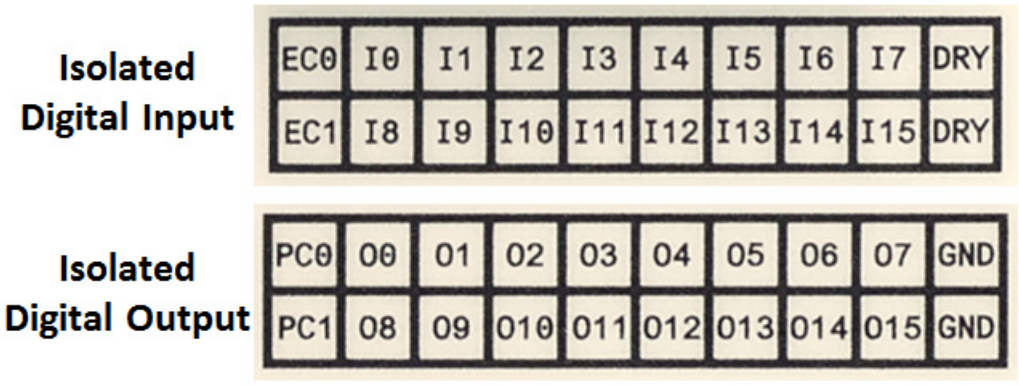
## 2.2.2 AMAX-4820 Pin Assignment

Analog Output



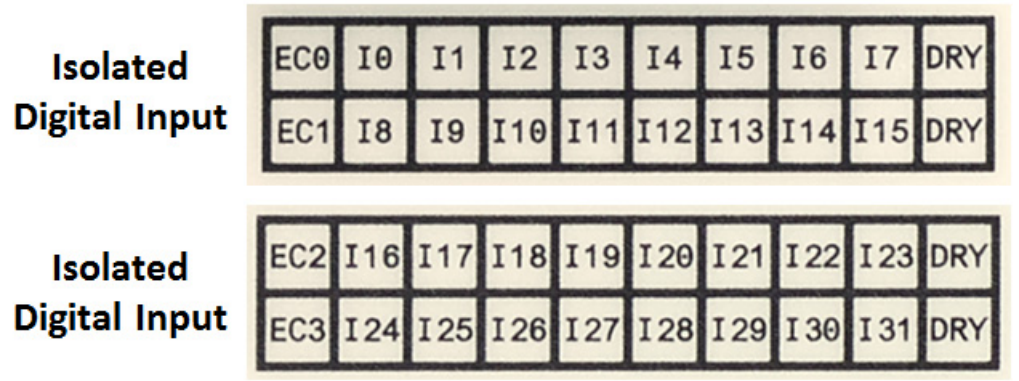

| Signal Name | Description |
|---|---|
| AO<0 ~ 3> | Analog output channels 0 through 3 |
| GND | Ground |

### 2.2.3 AMAX-4830/SO Pin Assignment



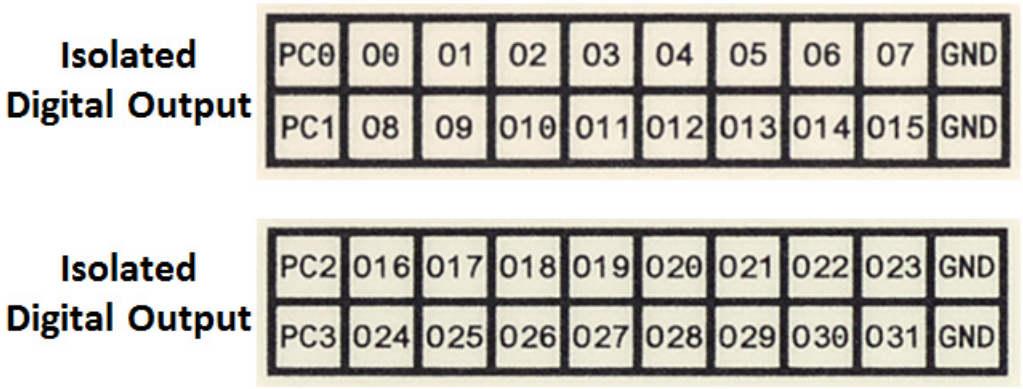

| Signal Name | Description |
|---|---|
| I<0 ~ 15> | Isolated digital input |
| EC0, EC1 | External common Vcc/GND for isolated digital input<br>(8 channels share 1 EC pin) |
| DRY | External ground for isolated digital input |
| O<0 ~ 15> | Isolated digital output |
| PC0, PC1 | Free wheeling common diode for isolated digital output<br>(8 channels share 1 PC pin) |
| GND | External ground for isolated digital output |

### 2.2.4 AMAX-4833 Pin Assignment



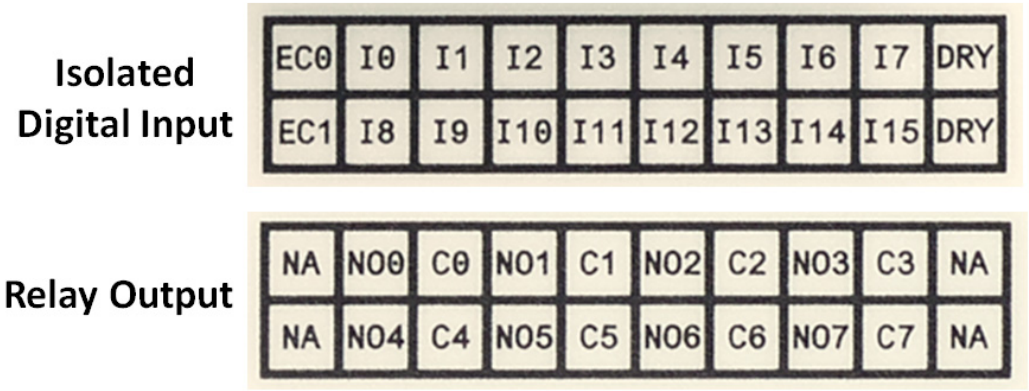

| Signal Name | Description |
|---|---|
| I<0 ~ 31> | Isolated digital input |
| EC0, EC1, EC2, EC3 | External common Vcc/GND for isolated digital input<br>(8 channels share 1 EC pin) |
| DRY | External ground for isolated digital input |

### 2.2.5 AMAX-4834 Pin Assignment




| Signal Name | Description |
|---|---|
| O<0 ~ 31> | Isolated digital output |
| PC0, PC1, PC2, PC3 | Free wheeling common diode for isolated digital output<br>(8 channels share 1 PC pin) |
| GND | External ground for isolated digital output |

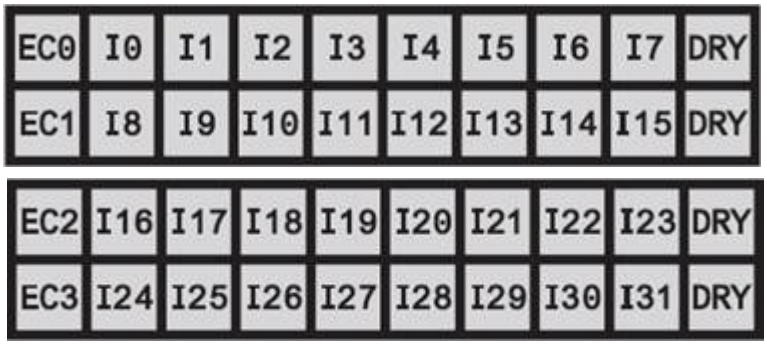
### 2.2.6 AMAX-4850 Pin Assignment



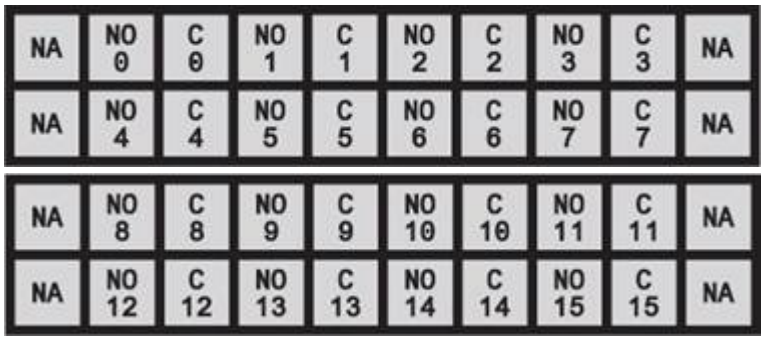

| Signal Name | Description |
|---|---|
| I<0 ~ 15> | Isolated digital input |
| EC0, EC1 | External common Vcc/GND for isolated digital input<br>(8 channels share 1 EC pin) |
| DRY | External ground for isolated digital input |
| NO<0 ~ 7> | Normally open pin of the relay output |
| C<0 ~ 7> | Normally closed pin of the relay output |
| NA | Not connected |

## 2.2.7 AMAX-4855 Pin Assignment

Isolated Digital Input




Relay Output

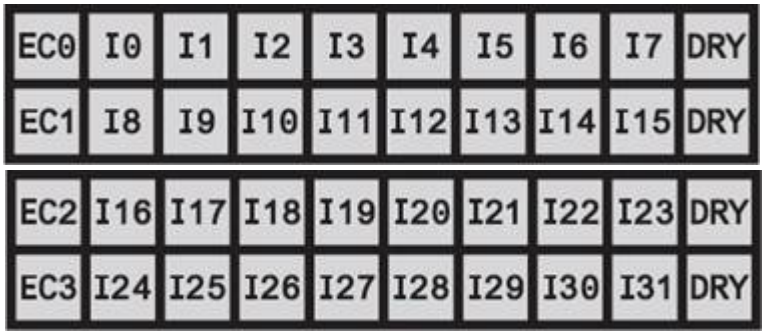



| Signal Name | Description |
|---|---|
| I<0 ~ 31> | Isolated digital input |
| EC0, EC1, EC2, EC3 | External common Vcc/GND for isolated digital input (8 channels share 1 EC pin) |

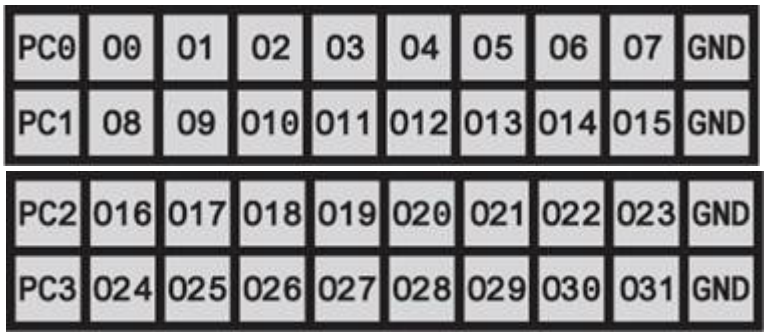
| | |
|---|---|
| DRY | External ground for isolated digital input |
| NO<0 ~ 15> | Normally open pin of the relay output |
| C<0 ~ 15> | Common pin of the relay output |
| NA | Not connected |

## 2.2.8 AMAX-4856 Pin Assignment

Isolated
Digital Input

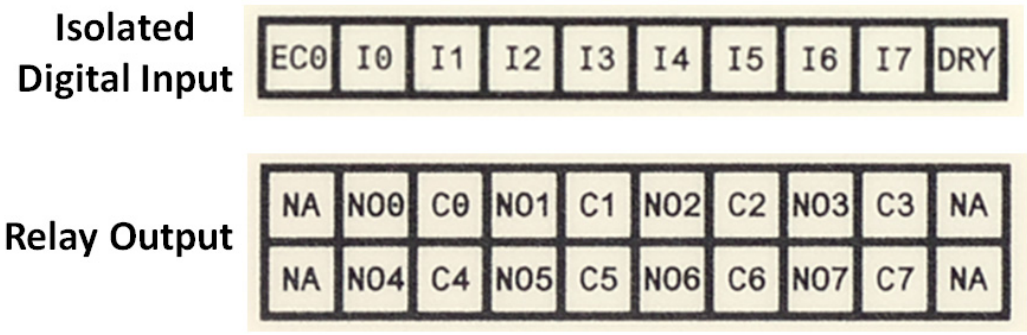



Isolated
Digital Output




| Signal Name | Description |
|---|---|
| I<0 ~ 31> | Isolated digital input |
| EC0, EC1, EC2, EC3 | External common Vcc/GND for isolated digital input<br>(8 channels share 1 EC pin) |
| DRY | External ground for isolated digital input |
| O<0 ~ 31> | Isolated digital output |
| PC0, PC1, PC2, PC3 | Free wheeling common diode for isolated digital output<br>(8 channels share 1 PC pin) |
| GND | External ground for isolated digital output |

## 2.2.9 AMAX-4860 Pin Assignment




| Signal Name | Description |
|---|---|
| I<0 ~ 7> | Isolated digital input |
| EC0 | External common Vcc/GND for isolated digital input (8 channels share 1 EC pin) |
| DRY | External ground for isolated digital inputs |
| NO<0 ~ 7> | Normally open pin of the relay output |
| C<0 ~ 7> | Normally closed pin of the relay output |
| NA | Not connected |

## 2.2.10 AMAX-4862 Pin Assignment

| | |
|---|---|
| Isolated Digital Input | EC0 I0 I1 I2 I3 I4 I5 I6 I7 DRY<br>EC1 I8 I9 I10 I11 I12 I13 I14 I15 DRY |
| Relay Output | NA NO 0 C 0 NO 1 C 1 NO 2 C 2 NO 3 C 3 NA<br>NA NO 4 C 4 NO 5 C 5 NO 6 C 6 NO 7 C 7 NA<br>NA NO 8 C 8 NO 9 C 9 NO 10 C 10 NO 11 C 11 NA<br>NA NO 12 C 12 NO 13 C 13 NO 14 C 14 NO 15 C 15 NA |

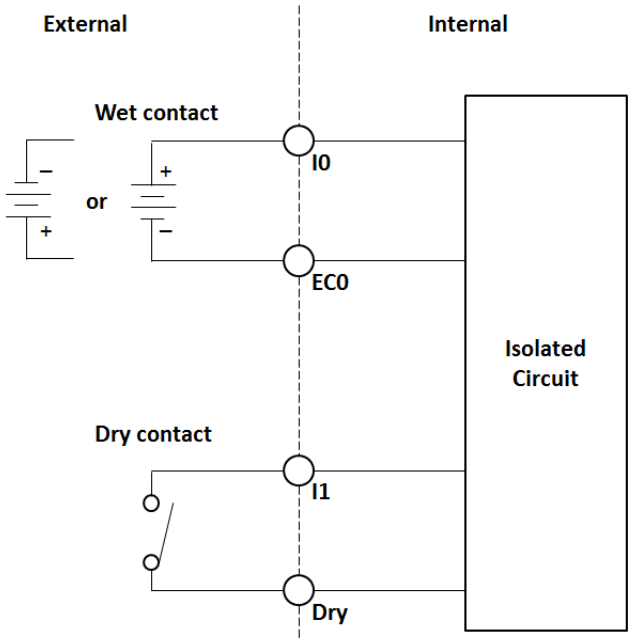
| Signal Name | Description |
|---|---|
| I<0 ~ 15> | Isolated digital input |
| EC0, EC1 | External common Vcc/GND for isolated digital inputs (8 channels share 1 EC pin) |
| DRY | External ground for isolated digital inputs |
| NO<0 ~ 15> | Normally open pin of the relay output |
| C<0 ~ 15> | Common pin of the relay output |
| NA | Not connected |

# 2.3 Connections

## 2.3.1 Isolated DI Connection

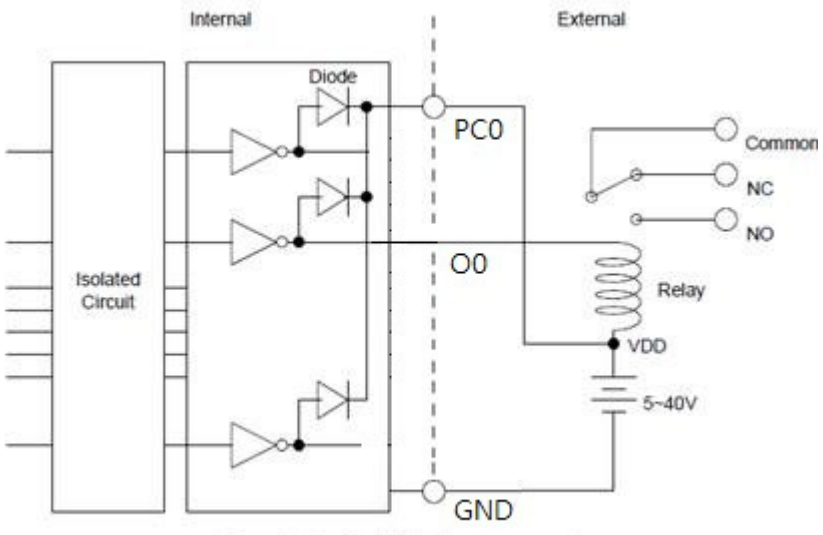
All isolated digital input channels accept voltages ranging from 10 to 30 V.

Additionally, every eight input channels share one external common pin (channels 0 ~ 7 use EC0, channels 8 ~ 15 use EC1). The figure below shows how to connect an external input source to the module's isolated inputs.

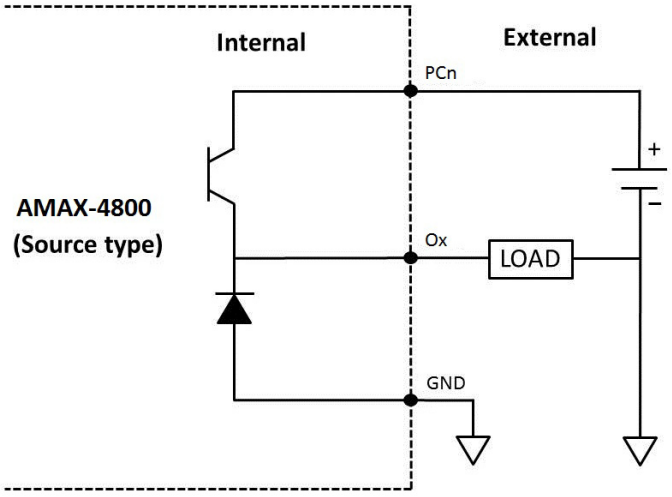



## 2.3.2 Isolated Digital Output

If an external voltage source (5 ~ 40 V) is connected to each isolated output channel (On) and its isolated digital output is turned on (350 mA max./ch), the module will sink current from the external voltage source. IDO modules provide GND pins for IDO connection. The following figures show how to connect an external output load to the module's isolated outputs for sink type and source type output respectively.



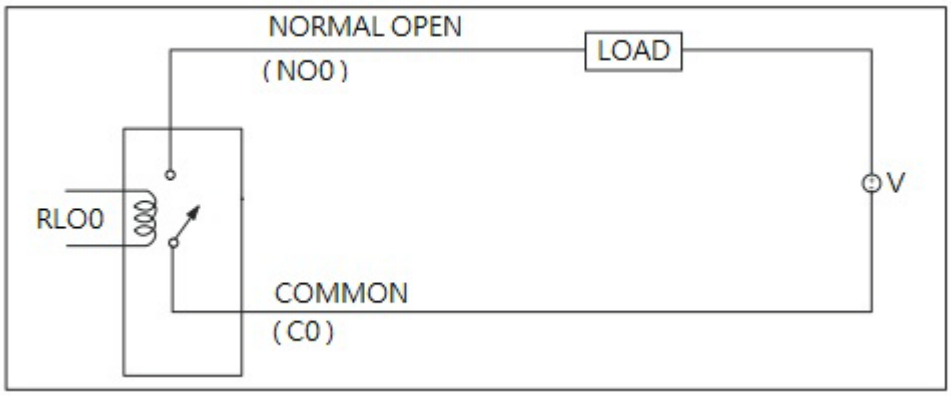

Sink type connection




Source type connection

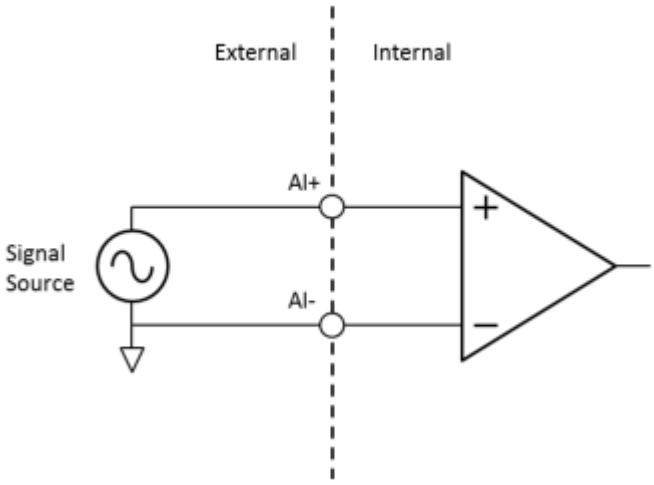
### 2.3.3 Relay Output

The figure below illustrates the structures and connections of the relay outputs.



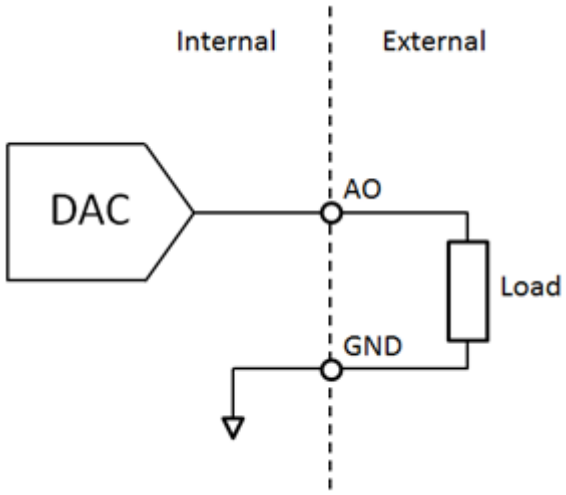

### 2.3.4 Analog Input Connections

AMAX-4817 provides eight differential analog input channels, as shown below.



### 2.3.5 Analog Output Connections

AMAX-4820 provides four single-ended analog output channels.




## 2.4 Switch

### 2.4.1 AMAX-4830SO

AMAX-4830SO provides separated COM connection that grouped every eight digital input/output channels. By default, the EC0, EC1, PC0 and PC1 are isolated from each other. However, in some cases that EC0 and EC1 need to be connected together and/or, similar situation happens to PC0 and PC1. These can be done by the SW2 and SW3. The EC0 and EC1 are connected together as the SW2 being switched to lower place. The SW3 makes identical effect to PC0 and PC1.

| | |
|---|---|
|  | **SW2 or SW3 switched to up position**<br>EC0 & EC1 Open<br>PC0 & PC1 Open |
|  | **SW2 or SW3 switched to down position**<br>EC0 & EC1 Close<br>PC0 & PC1 Close |

# 2.5 Field Wiring Consideration

This chapter describes the general consideration when performing field wiring for AMAX-4800 series EtherCAT remote I/O modules. For detailed explanation of guideline for planning, assembling, and commissioning of EtherCAT networks, please refer to the ETG document “ETG.1600 EtherCAT Installation Guide”.

(https://www.ethercat.org/download/documents/ETG1600_V1i0i2_G_R_InstallationGuideline.pdf)

## 2.5.1 Cable Length

According to the structured cabling model defined in the ISO/IEC 11801 specification, cables employed in the connection between two end devices can be distinguished into (as shown in Figure 2-1):

1. Permanent link, which is the main cable span between two end devices, installed either within or outside the cabinet.
2. Patch cords, which are typically short cable sections, used within a cabinet between end devices and intermediate connection points (like bulkhead feed-through connectors)

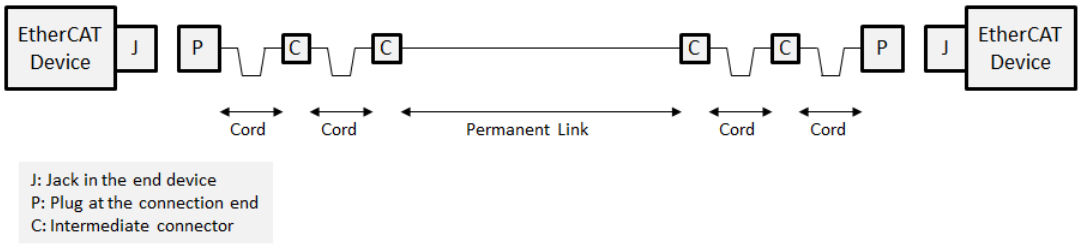



**Figure 2.1 Cable mode in ISO/IEC 11801**

In terms of planning the EtherCAT networks with use of 100BASE-TX link (copper wire), the following rules can be considered:

1. The total length of the communication channel (including permanent link and all patch cords) should not exceed 100 m.
2. The total length of the patch cords at each end should not exceed 5 m, and the length of the permanent link should be reduced accordingly to meet the maximum channel length of 100 m as described previously.
3. The maximum number of connections in the channel should be 6 including connectors at each end.
4. In any case, the channel length should be kept as short as possible.

Figure 2-2 shows some possible channel architectures according to these rules.

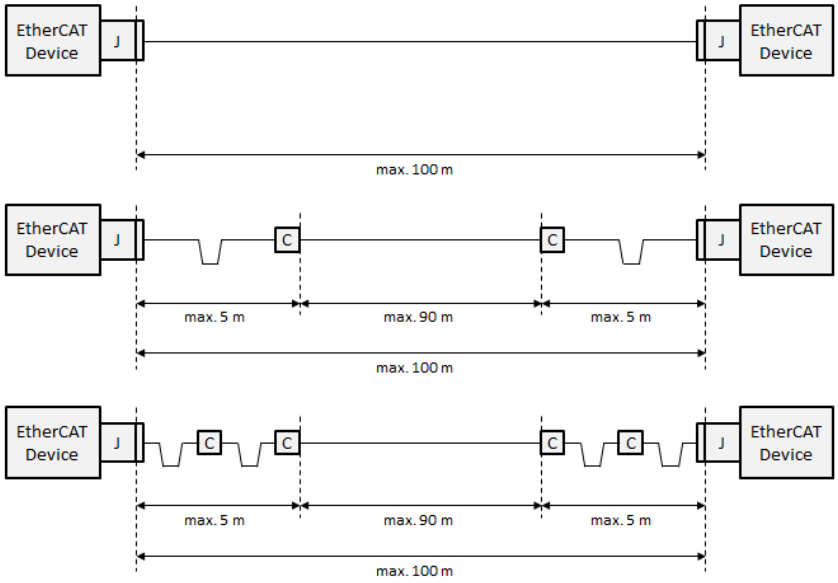



**Figure 2.2 Several possible channel architectures**

## 2.5.2 Cable Selection

The IEC 61784-5-12 profile describes suggested cable types for EtherCAT applications and specifies the worst-case corner values for the cable parameters which should not be exceeded within an EtherCAT channel.

In case of connections between devices moving with respect to each other, flexible cables should be used in order to prevent cable damage. In this case, parameters like maximum permissible bending radius, as well as maximum tolerated tensile and torsional forces, should be carefully verified to be compliant with the application requirements.

Figure 2-3 shows the difference between a fixed cable and a flexible cable in section views, and Table 2-1 lists the recommended parameters for both types of cables to be used for an EtherCAT channel. Parameter values (for example, insertion loss) measured for flexible cables are typically worse than those of fixed cables. The use of flexible cables should therefore be limited to scenarios where it is strictly needed.

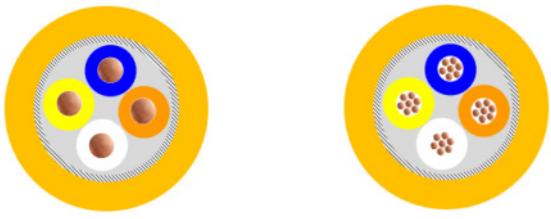



**Figure 2.3 Difference between a fixed cable and a flexible cable**

**Table 2.1: Recommended cable parameters.**

| Item | Fixed Cable | Flexible Cable |
|---|---|---|
| Type | AWG22/1 | AWG22/7 |
| Shielding | S/FTQ | S/FTQ |
| Round-Trip Resistance | ≤ 115 Ω/km | ≤ 115 Ω/km |
| Insertion Loss @ 100 MHz | 19.5 dB/100 m | 21.3 dB/100 m |
| Near-End Crosstalk @ 100 MHz | 50 dB/100 m | 50 dB/100 m |

EtherCAT recommends the use of at least externally shielded cables, both for the permanent link and for patch cords.

The stranded solution should be preferred for the external cable shielding, as it provides higher mechanical robustness. When using externally foil-shielded cables, particular care should be paid not to damage or to interrupt the shielded itself.

Figure 2-4 shows the recommended and discouraged shielding configurations

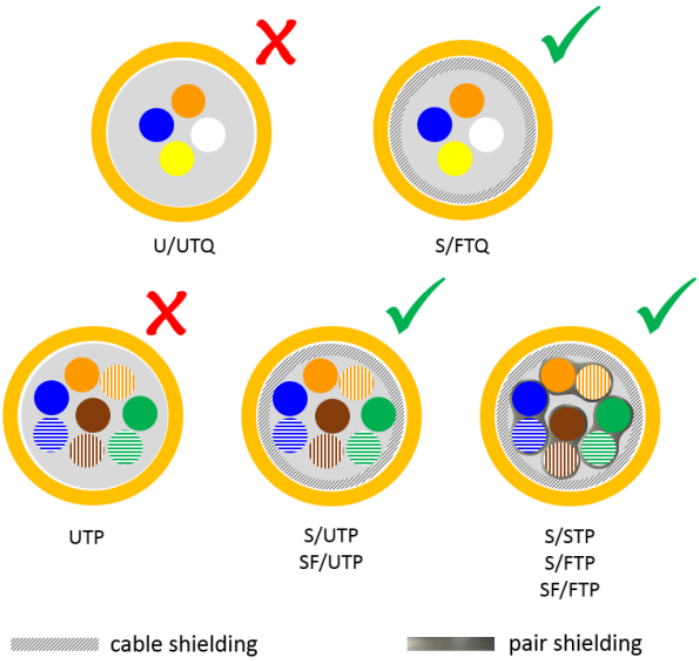



**Figure 2.4 Recommended and discouraged shielding configurations**

### 2.5.3 Registered Jack 45 (RJ45) Selection

A registered jack 45 (RJ45) is a standardized telecommunication network interface for connecting voice and data equipment to a service provided by a local exchange carrier or long distance carrier. The material, configuration, and quality of the RJ45 will affect the communication signal quality as well.

To ensure a good contact between the jack (plug) and the receptacle, the contact plating (as indicated in Figure 2-5) of the jack should be at least 30 µm gold plating. Do not use gold flash plating.



**Figure 2.5 Contact plating of the RJ45.**

In addition, use trident pin needle instead of two-fork pin needle for the gold plate tripod as shown in Figure 2-6. This gives more contact area and improves signal integrity in high speed transmission.

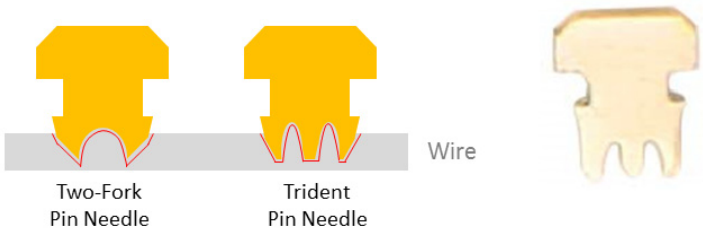



**Figure 2.6 Gold plate tripod types.**

For better electromagnetic immunity, a shielded RJ45 can be used. An example is shown in Figure 2-7.



**Figure 2.7 Shielded RJ45.**

It should be noted that the metal shell of the shielded RJ45 must be electrically connected to the drain wire of the shielded cable for the shield to take effect. For example, a shielded RJ45 with tail clip can be used to touch the drain wire, and the drain wire can be wrapped by a copper tape to increase the contact area with the metal shield of the RJ45 as shown in Figure 2-8. The drain wire can even be soldered to the metal shield to ensure stable contact. Failing to do this will result in no shielding effect at all.

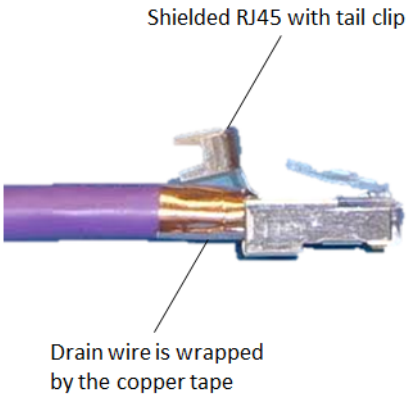



**Figure 2.8 Connect metal shield of RJ45 to drain wire**

## 2.5.4 Electromagnetic Protection

### 2.5.4.1 Cable Separation

In order to prevent electromagnetic disturbances to corrupt the signals and therefore affect the communication performances, the network planning should always guarantee a suitable separation of communication cables from other cable types, and especially from power cables like supply lines or motor connections. This is shown in Figure 2-9

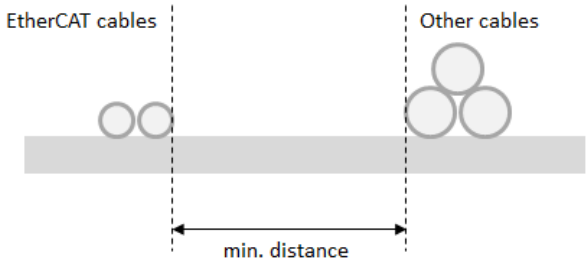



**Figure 2.9 Minimum distance between communication and power cables.**

In order to improve the immunity to electromagnetic disturbances and to reduce the minimum permissible distance from power lines, EtherCAT cables can be routed through metallic enclosures or conduits as shown in Figure 2-10.

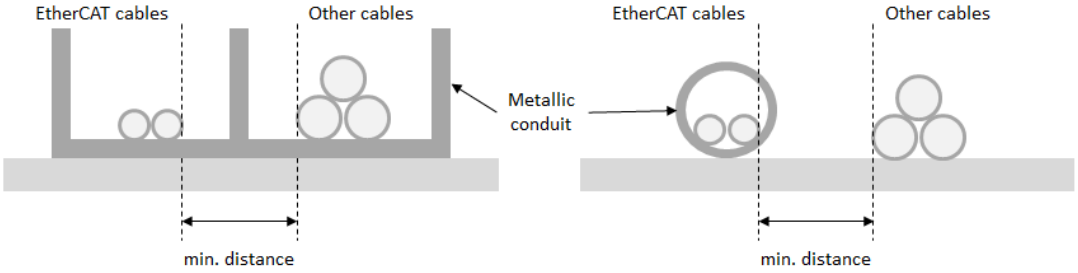



**Figure 2.10 Minimum distance with metallic separation conduits.**

Table 2-2 lists the recommended minimum distance between communication cables and power cables.

| Type of Separation | Minimum Distance |
|---|---|
| Without metallic separation | 10 mm |
| Open metallic cable conduit | 8 mm |
| Perforated metal plate conduit | 5 mm |
| Bulky cable conduit | 0 mm |

### 2.5.4.2 Cable Crossing

In case communication cable must cross power lines, this should always take place at right angle (90 degrees). Do not place them in the same direction (parallel). This is shown in Figure 2-11.

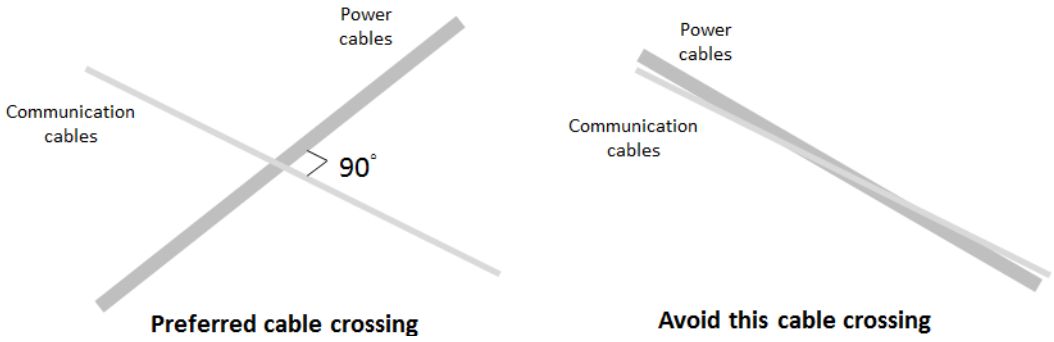



**Figure 2.11 Communication cable and power cable crossing**

### 2.5.4.3 Avoid Cable Loop

Coils in the communication cables should be avoided, as they represent large areas where electromagnetic disturbances can be introduced into the network and severely affect the communication performances as shown in Figure 2-12.

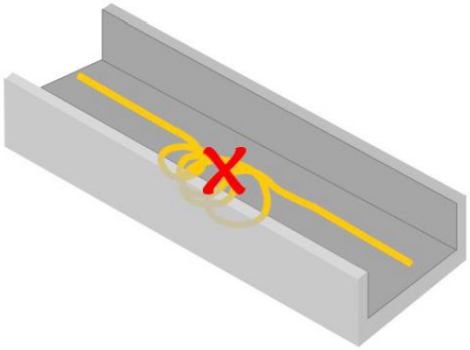


**Figure 2.12 Avoid loops in communication cables**

## 2.5.5 Earthing and Grounding

In order to provide the highest immunity against electromagnetic disturbances as well as undesired noise, all the electronic components and chassis enclosures or metallic pathways within the machine or plant should be kept at the same reference potential by means of suitable earthing connections.

According to the ISO/IEC 61918 specification, two earthing schemes have proven to be effective in the industrial environment: equipotential and star.

### 2.5.5.1 Equipotential Earthing

In the equipotential earthing, devices chassis and pathways are connected wherever possible to the building metallic structure, which is in turn connected to the functional earth. Figure 2-13 shows this scheme. This forms a mesh providing the same reference potential to all EtherCAT devices and infrastructure components.

Note that the negative power terminal and earth may possess different potentials, do not connect them together to prevent disturbances

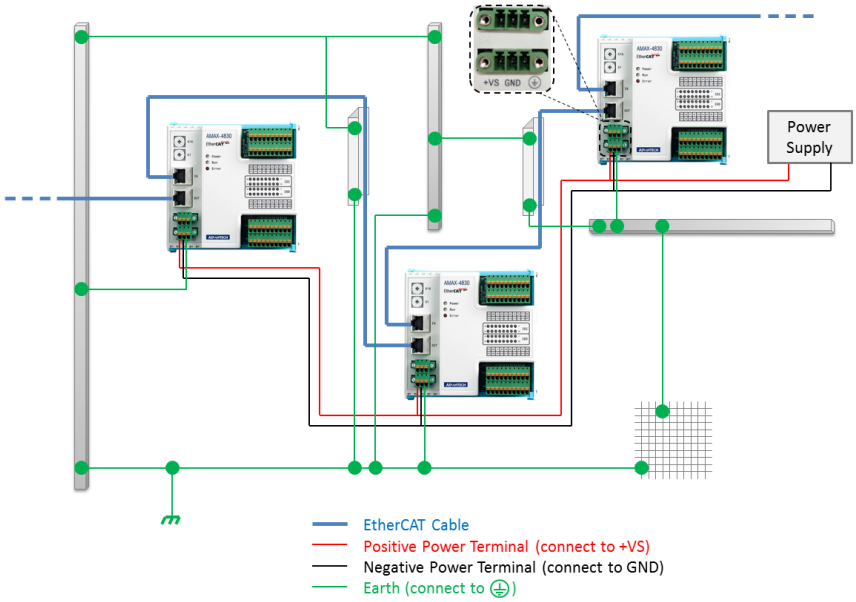



**Figure 2.13 Equipotential earthing scheme**

### 2.5.5.2 Star Earthing

In case medium or high currents are generated within the application, earth paths would form current loops which could in turn determine potential differences among network devices. In this case, a star connection to a single point which is in turn connected to the functional earth could represent a more effective earthing solution. This is shown in Figure 2-14.

Note that the negative power terminal and earth may possess different potentials, do not connect them together to prevent disturbances.

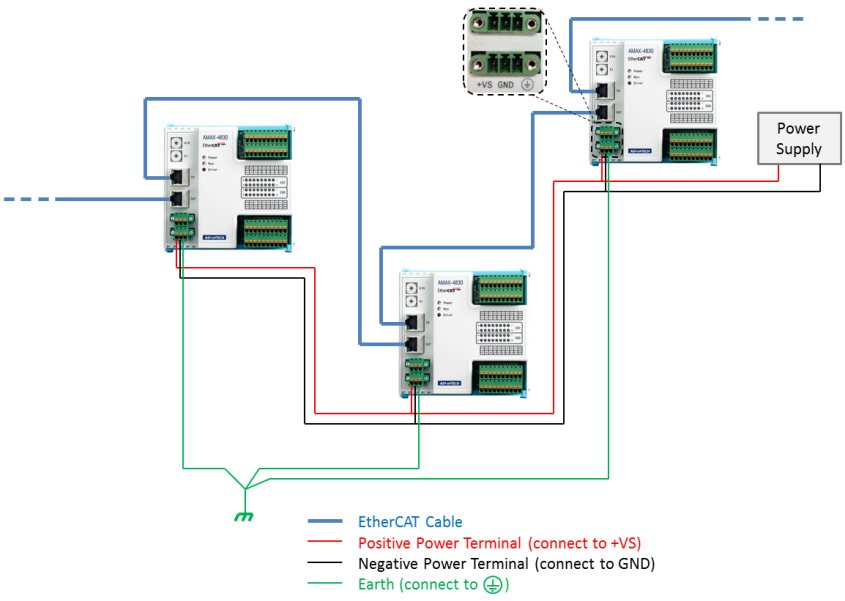



**Figure 2.14 Star earthing scheme**

### 2.5.5.3 Other Notes

In order for the earthing system to provide efficient rejection of electromagnetic disturbances and undesired noise, the impedance between each device or metal chassis and the functional earth should be as low as possible, typically lower than 0.6 Ω and in any case lower than 1 Ω.

## 2.5.6 Power Separation

To maintain a stable power for control circuitry in the EtherCAT slave I/O modules, it is strongly recommended to use a separate power supply for other heavily loaded or noisy devices, such as high power converters and amplifiers, contactors, solenoids, motors, motor-drives, and sensors. Figure 2-15 shows this power separation scheme.

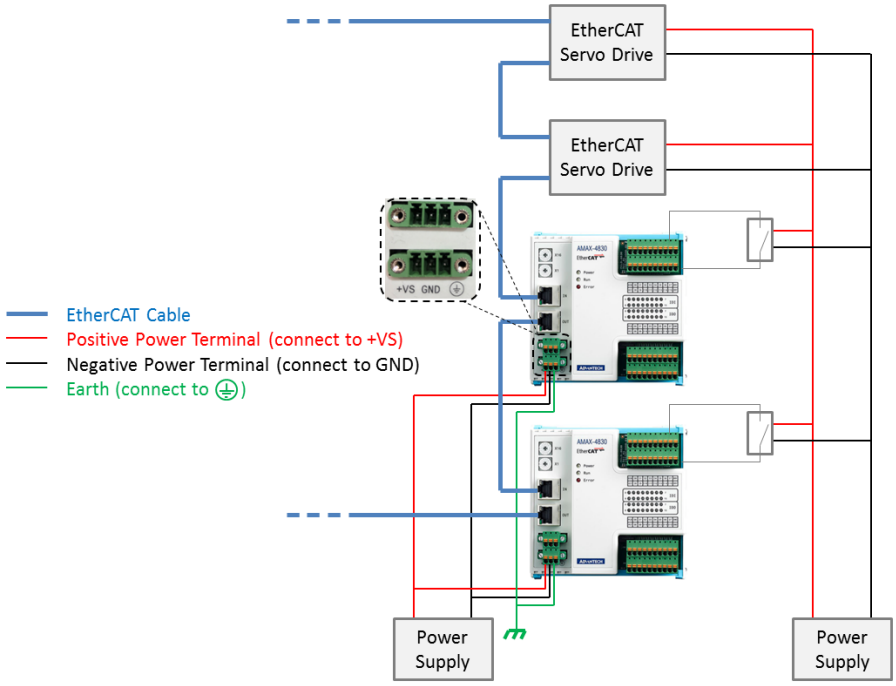



**Figure 2.15 Power separation.**

For more robust system design, galvanic isolation between the two power domains can be applied, as shown in Figure 2-16.

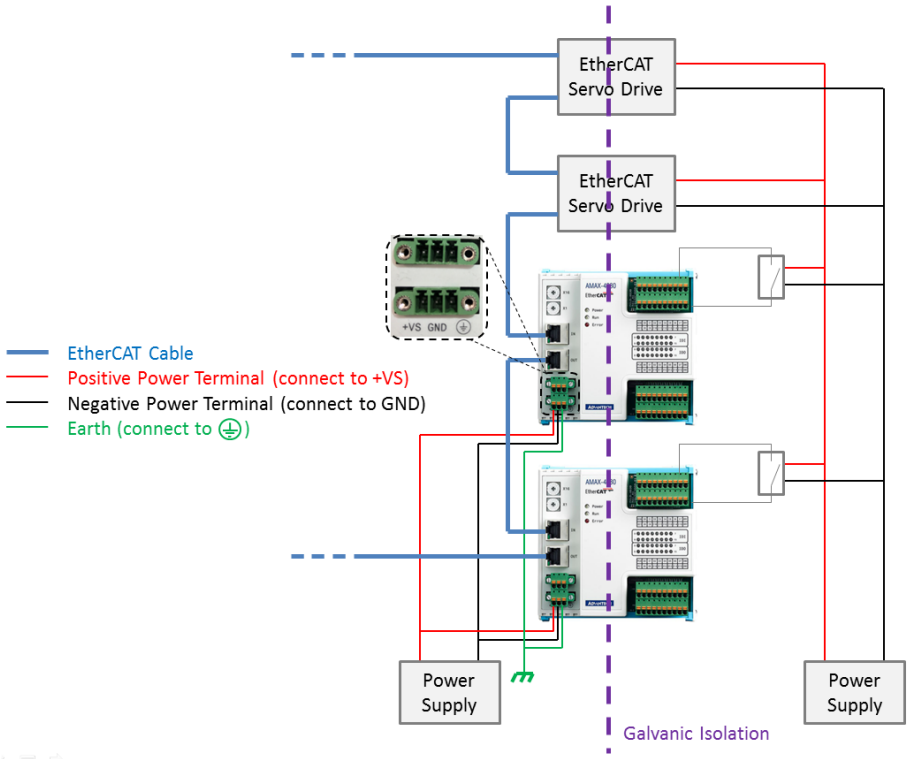



**Figure 2.16 Power separation with isolation**

# Chapter 3

## Getting Started

# 3.1 Introduction

This chapter explains how to access the AMAX-4800 module through the Advantech Common Motion utility, Bechhoff TwinCAT and Codesys. These utilities provide a Windows-based application development environment for users to configure and verify AMAX-4800 function. The parameter settings are easy to configure, shortening the system installation and evaluation time.

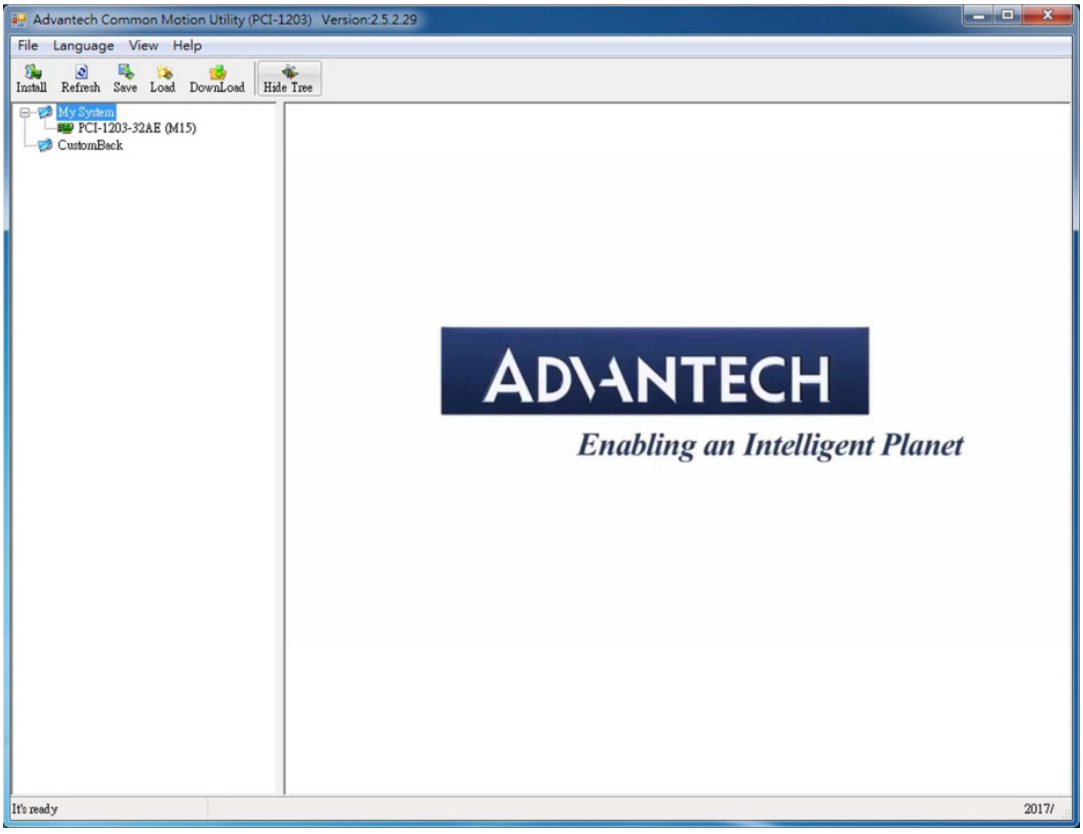
# 3.2 Advantech Common Motion Utility (PCI-1203)

Access AMAX-4800 via the Advantech Common Motion utility. Install the PCI-1203 driver provided on the enclosed CD or downloaded from the Advantech website.

## 3.2.1 Main Form

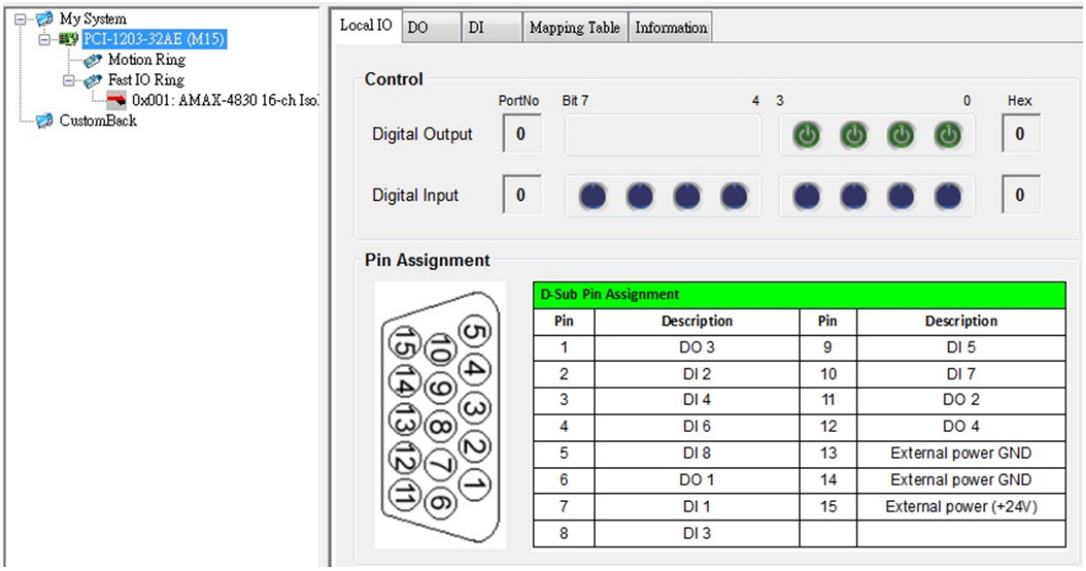
Right click the Common Motion Utility (PCI-1203) icon in the Common Utility folder.



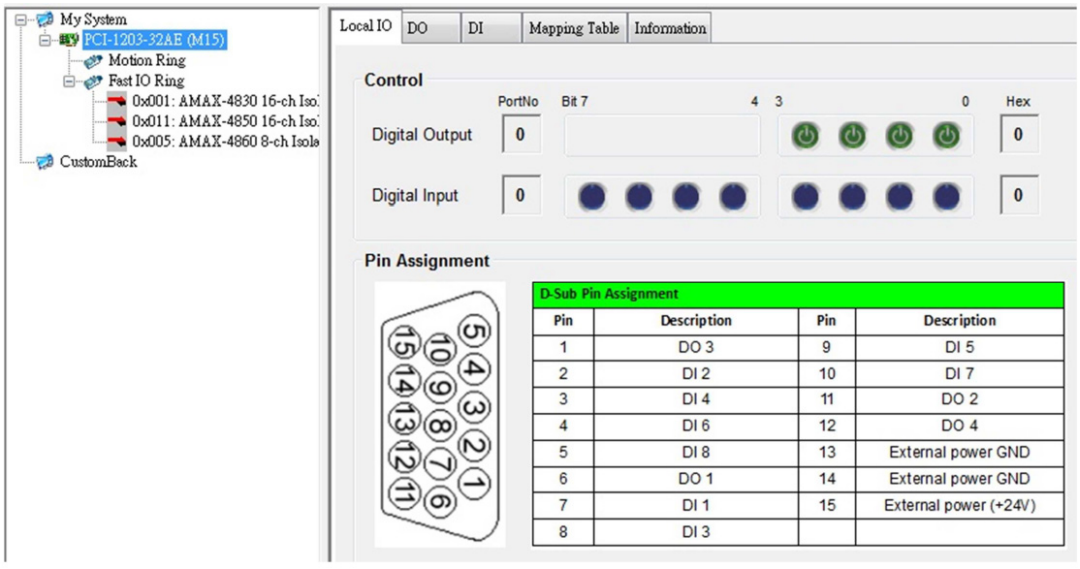
### 3.2.2 Master Page

The slaves connected to PCI-1203 will be listed under the Fast I/O Ring menu item.The specifications of the AMAX-4800 module are shown in the right panel.




### 3.2.3 Module Page

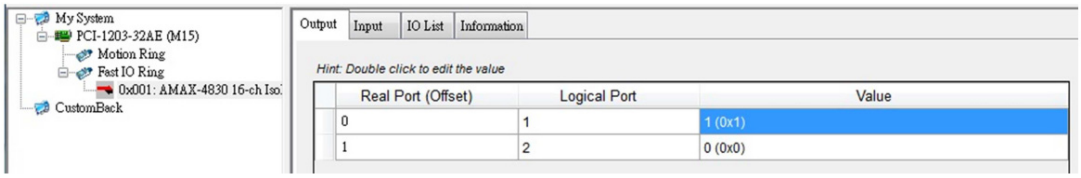
If the EtherCAT slave is AMAX-4830, for example, the modules connected to the Advantech Common Motion utility will be shown in the slave tree node.




***Note!*** *If more than one slave module is connected, each module must be assigned a unique slave ID.*

### 3.2.3.1 Digital Input/Output Modules

AMAX-4830 supports 16 digital input channels and 16 digital output channels.




To set the output/input value, left click the port value to access the Set Value pop-up menu.




## 3.3 TwinCAT®

TwinCAT software was developed by Beckhoff for operating EtherCAT devices. EtherCAT slave information (ESI) files must be imported to the TwinCAT folder for the AMAX-4800 module to function correctly.

### 3.3.1 EtherCAT Slave Information (ESI) Files

For each EtherCAT slave, a device description known as the ESI, must be provided in the form of an XML file. This file describes the EtherCAT specifications as well as the application-specific features of the slave. ESI files must be imported into the TwinCAT I/O EtherCAT installation folder before initiating TwinCAT.

The default path of the installation folder is
C:\TwinCAT\Io\

After importing the ESI file, reopen TwinCAT and wait for the utility rebuild the EtherCAT device description cache.



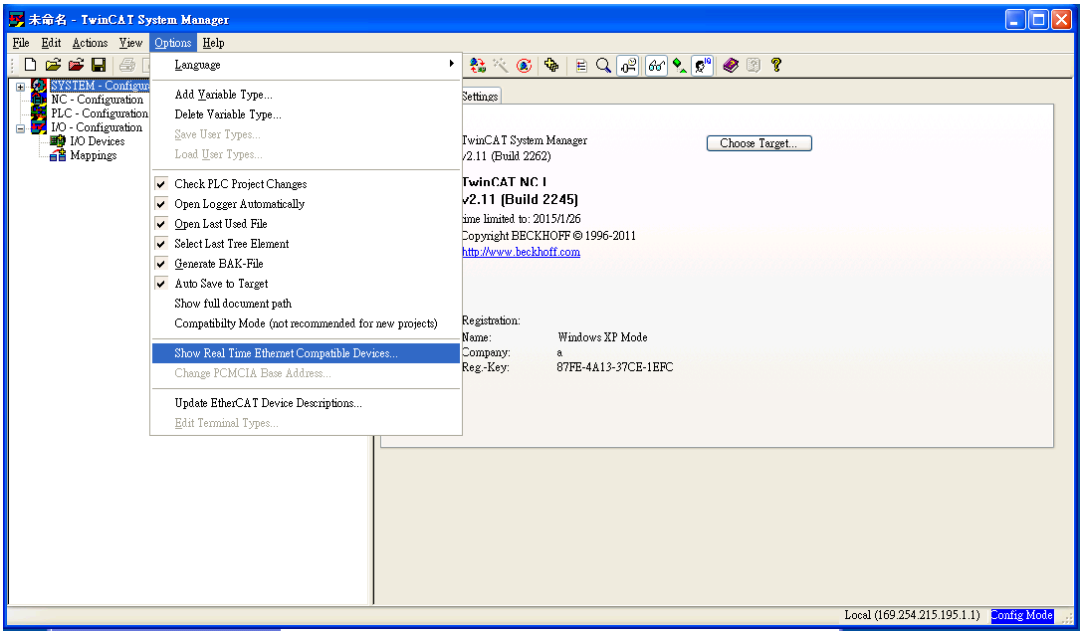
### 3.3.2 Main Form

To start the TwinCAT System Manager software, right click the TwinCAT icon in the system tray and choose System Manager.



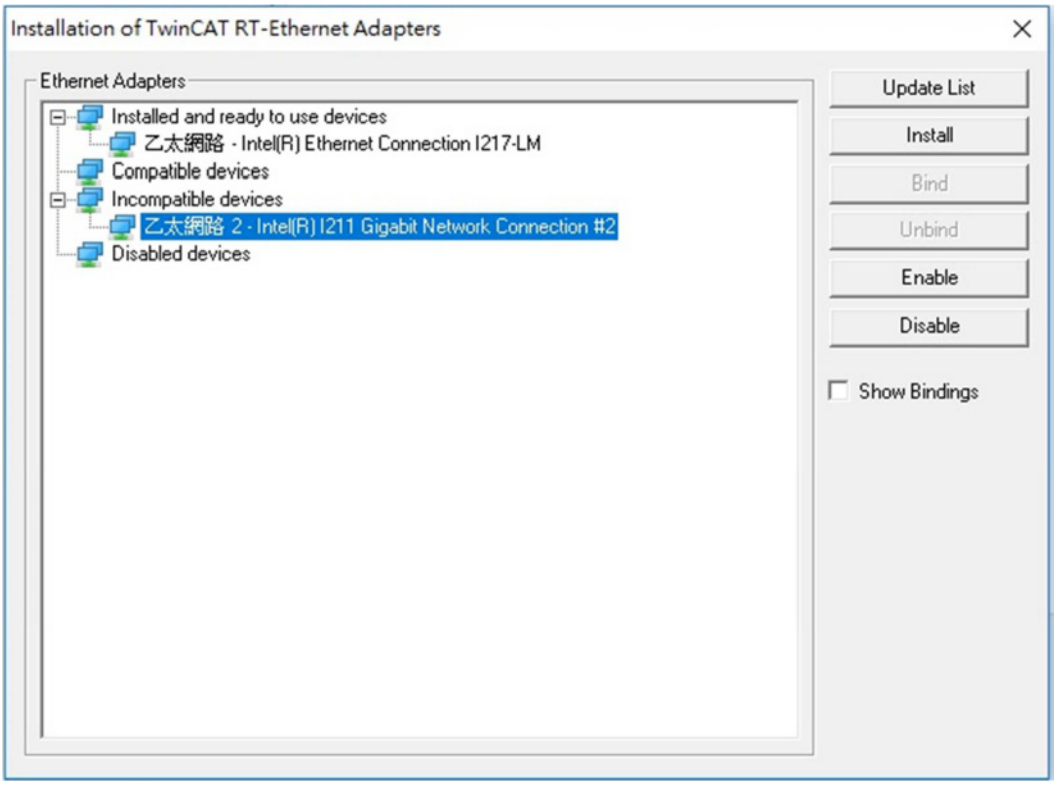

### 3.3.3 Install EtherCAT Driver

Before initializing TwinCAT, the EtherCAT network interface card driver must be installed. Click on the Options menu and select the Show Real-Time Ethernet Compatible Drivers option.



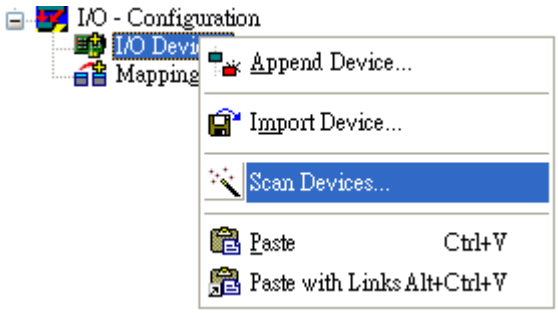

All of the network interface cards are listed in the [incompatible devices] tree node. Select the device to be used for EtherCAT by TwinCAT and click the Install button. After the driver is installed, the devices will be shown in the Installed and Ready to Use Devices node.

Although the driver is installed for TwinCAT use, it does not differ from a standard network interface card and can still connect to Ethernet.




### 3.3.4 Scan for AMAX-4800 Series Devices

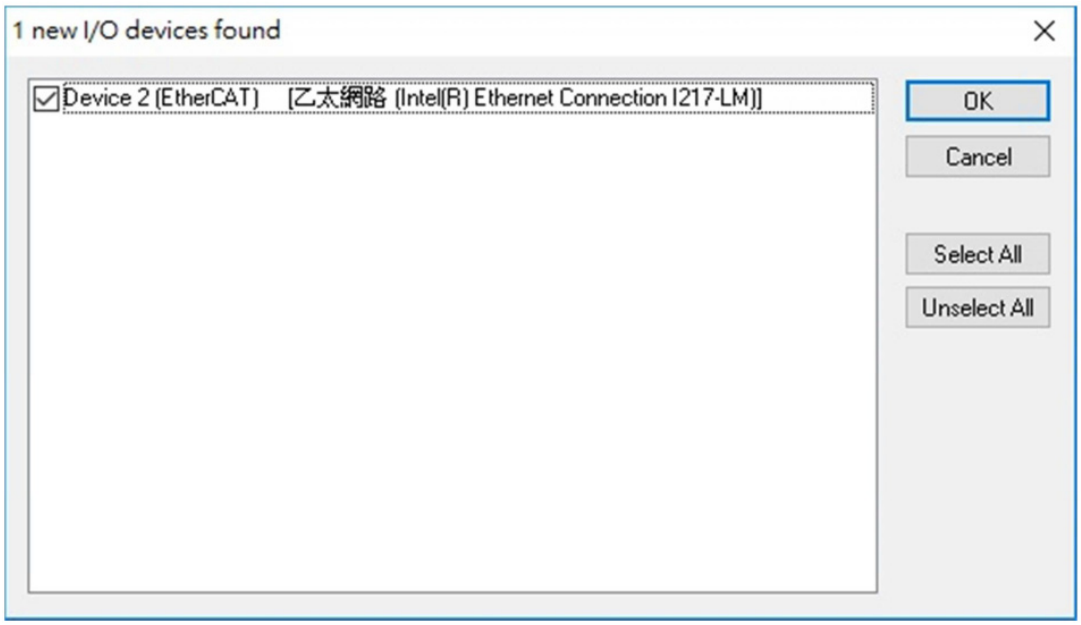
Select the I/O - Configuration -> I/O Devices menu item, then right click and select Scan Devices to initiate a scan for EtherCAT devices. Before scanning the devices, ensure that TwinCAT is in the Config mode. The current mode of the TwinCAT System Manager is displayed at the lower right corner of the utility. Users can switch between modes by clicking the  button and selecting  in the toolbar.



Click [OK] when the HINT window appears.




All network interface cards will be listed in the popup window. If slaves are connected to the network interface card and have been identified by TwinCAT, the device check box will be checked.



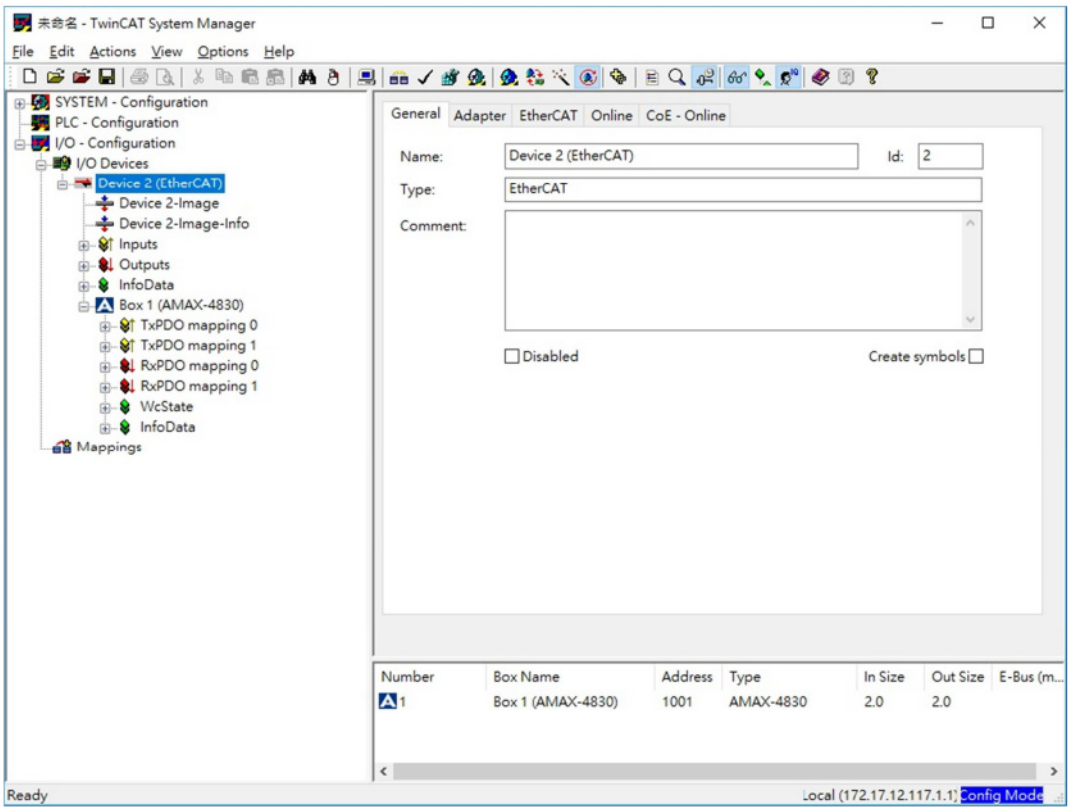

Click [Yes] to scan for EtherCAT slave devices.



Click [Yes] to activate the slaves.




After activation, AMAX-4800 will be listed as a slave device of the EtherCAT master and the “Run” status LED will emit a green light. This indicates that the user can begin operating the device.

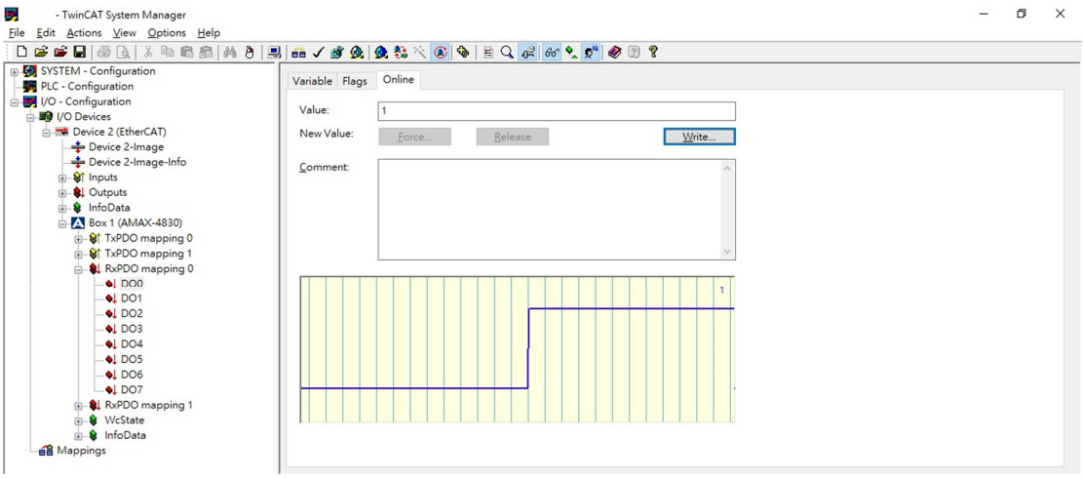


### 3.3.5 Port Operation

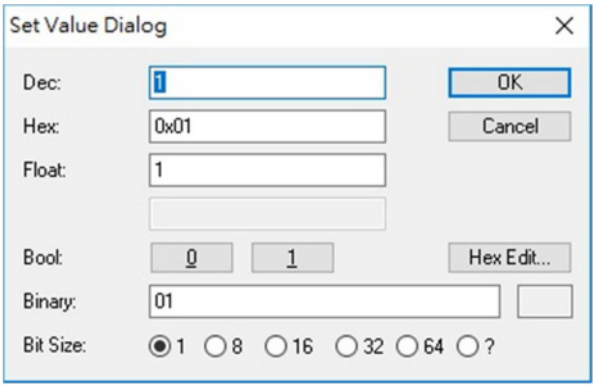
In the left window of the TwinCAT System Manager, right click on the branch to be configured.

**Digital Input/Output Modules**

For this example, an AMAX-4830 module is plugged into Slot 1 of AMAX-4830. There are 16 digital input channels and 16 digital output channels, and each port comprises 8 channels. To set the output value of the third port (DO0 ~ DO7), right click on the “DO0” branch at the left of the window. In the Online tab, click the Write button to set the value.




In this case, the value of the first port is set as 1, which means the DO0 signals are set to High.

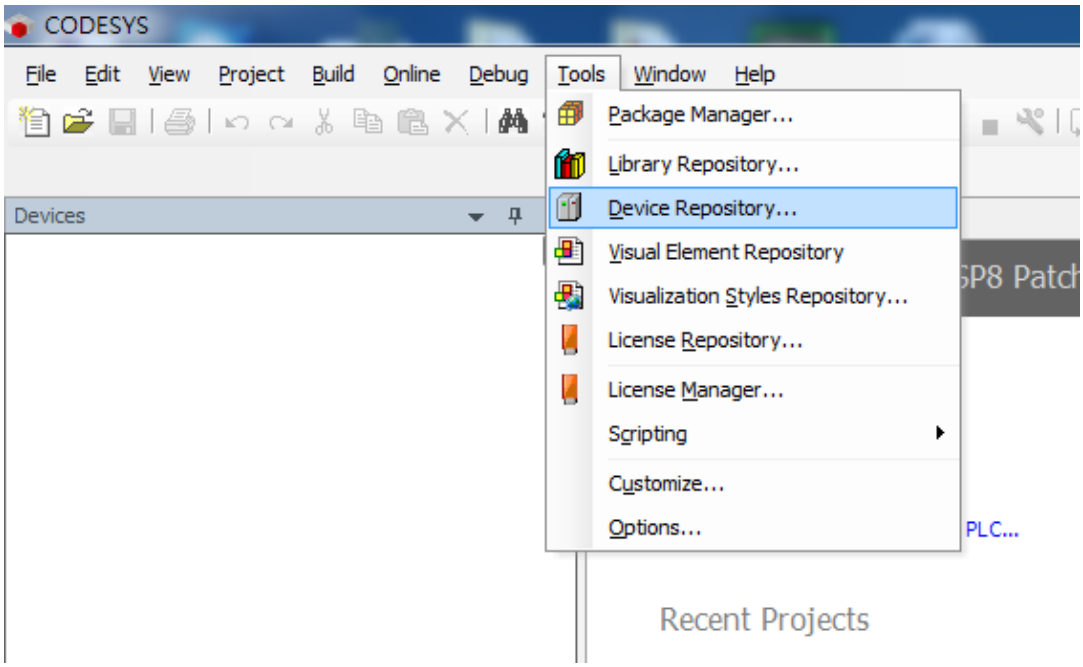


## 3.4 CODESYS

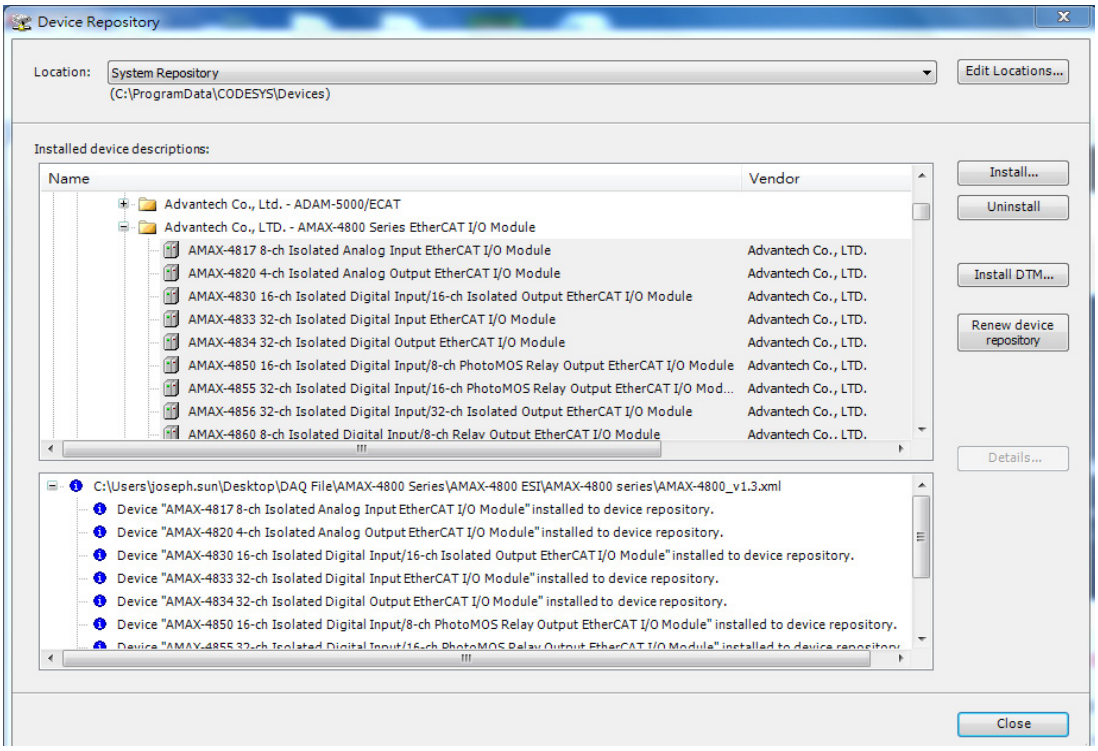
The CODESYS engineering tool is the standard widely implemented in OEM products. The logic support and HMI integration makes CODESYS ideal for numerous applications, including machine automation, factory automation, building automation, and facility/infrastructure management.

### 3.4.1 Import ESI Files to CODESYS

1. Open the CODESYS software:
   Select Tools -> Device Repository




2. Click [Install] to import the AMAX-4800 ESI file into CODESYS.

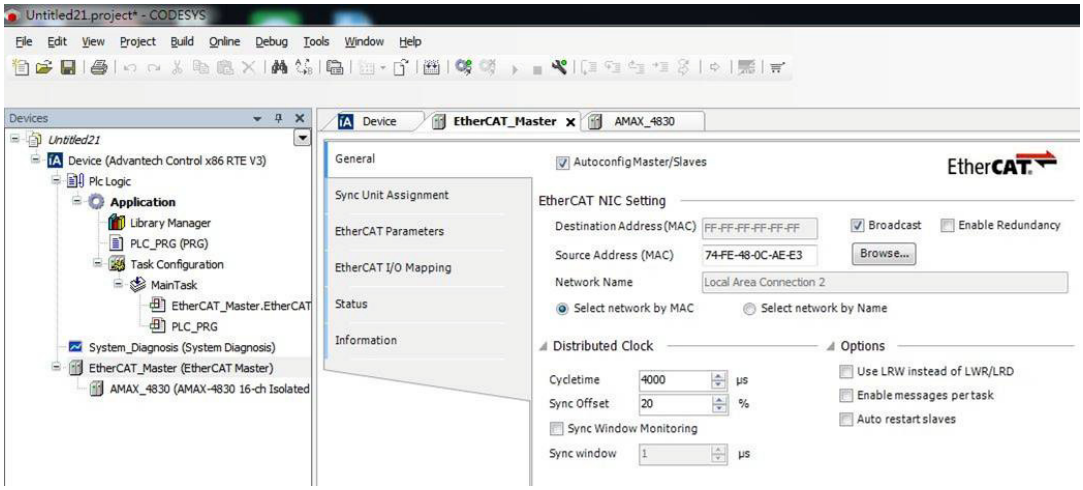


## 3.4.2 How to Use the AMAX-4800 Series with CODESYS

### Master Page

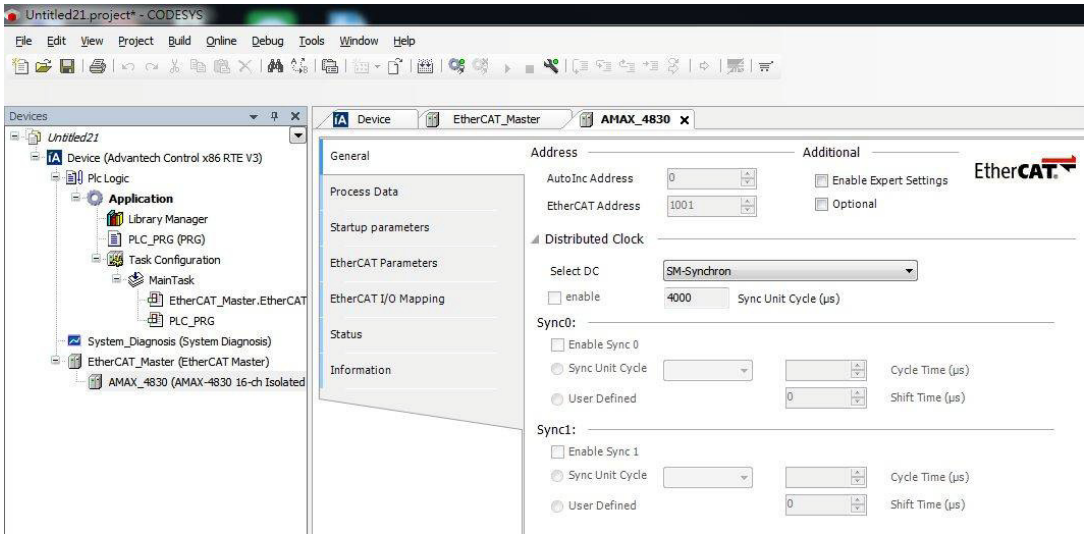
The slaves connected to the CODESYS system will be listed under the EtherCAT_Master menu item.

The specifications of the AMAX-4800 module are shown in the right panel.




### Module Page

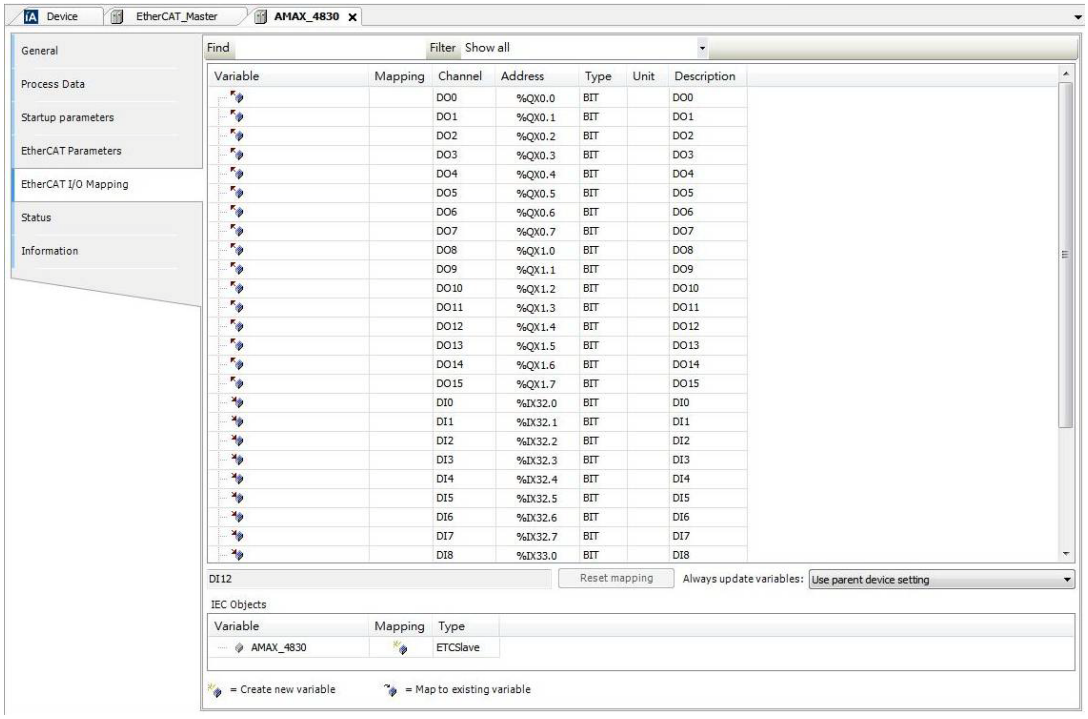
If the EtherCAT slave is AMAX-4830, for example, the modules connected to the CODESYS utility will be shown in the slave tree node.



### I/O Mapping Variables

There are 16 digital input and 16 digital output channels and the data type of each channel variable is in single bit.

If the value is 1, this means that the channel is on; if the value is 0, this means that the channel is off. All channel values can be represented as one word.




# 3.5 Module Configuration

## 3.5.1 AMAX-4817: 8-Channel Analog Input Module

### 3.5.1.1 Object Dictionary Configuration

- **Analog Input Range**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2180:01 | AI 0 Range | UINT16 | RW | 0x0000 (0dec) |
| 2181:01 | AI 1 Range | UINT16 | RW | 0x0000 (0dec) |
| 2182:01 | AI 2 Range | UINT16 | RW | 0x0000 (0dec) |
| 2183:01 | AI 3 Range | UINT16 | RW | 0x0000 (0dec) |
| 2184:01 | AI 4 Range | UINT16 | RW | 0x0000 (0dec) |
| 2185:01 | AI 5 Range | UINT16 | RW | 0x0000 (0dec) |
| 2186:01 | AI 6 Range | UINT16 | RW | 0x0000 (0dec) |
| 2187:01 | AI 7 Range | UINT16 | RW | 0x0000 (0dec) |

0: ±10 V

1: 0 ~ 10 V

### Analog Input Data (PDO)

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 6000:01 | AI 0 | UINT16 | RO P | 0x0000 (0dec) |
| 6000:02 | AI 1 | UINT16 | RO P | 0x0000 (0dec) |
| 6000:03 | AI 2 | UINT16 | RO P | 0x0000 (0dec) |
| 6000:04 | AI 3 | UINT16 | RO P | 0x0000 (0dec) |
| 6000:05 | AI 4 | UINT16 | RO P | 0x0000 (0dec) |
| 6000:06 | AI 5 | UINT16 | RO P | 0x0000 (0dec) |
| 6000:07 | AI 6 | UINT16 | RO P | 0x0000 (0dec) |
| 6000:08 | AI 7 | UINT16 | RO P | 0x0000 (0dec) |

For the ±10 V range (2's complement):

| Raw Data | Measured Voltage |
|---|---|
| 0x7FFF | 9.999695 V |
| 0x0001 | 0.000305 V |
| 0x0000 | 0.000000 V |
| 0xFFFF | -0.000305 V |
| 0x8000 | -10.000000 V |

For the 0 ~ 10 V range:

| Raw Data | Measured Voltage |
|---|---|
| 0x7FFF | 9.999695 V |
| 0x0001 | 0.000305 V |
| 0x0000 | 0.000000 V |

### Calibration Parameters

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2180:02 | AI 0 Offset Calibration Parameter | UINT16 | RW | 0x0000 (0dec) |
| 2180:03 | AI 0 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |
| 2181:02 | AI 1 Offset Calibration Parameter | UINT16 | RW | 0x0000 (0dec) |
| 2181:03 | AI 1 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |
| 2182:02 | AI 2 Offset Calibration Parameter | UINT16 | RW | 0x0000 (0dec) |
| 2182:03 | AI 2 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |
| 2183:02 | AI 3 Offset Calibration Parameter | UINT16 | RW | 0x0000 (0dec) |
| 2183:03 | AI 3 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |
| 2184:02 | AI 4 Offset Calibration Parameter | UINT16 | RW | 0x0000 (0dec) |
| 2184:03 | AI 4 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |
| 2185:02 | AI 5 Offset Calibration Parameter | UINT16 | RW | 0x0000 (0dec) |
| 2185:03 | AI 5 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |
| 2186:02 | AI 6 Offset Calibration Parameter | UINT16 | RW | 0x0000 (0dec) |
| 2186:03 | AI 6 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |
| 2187:02 | AI 7 Offset Calibration Parameter | UINT16 | RW | 0x0000 (0dec) |
| 2187:03 | AI 7 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |

$$CODE_CAL = (CODE + OffsetPar) \times \left(\frac{GainPar + 2^{15}}{2^{16}}\right)$$

### Load/Save Calibration Parameters

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2190:01 | Load Calibration Parameters | UINT16 | RW | 0x0000 (0dec) |

1: Load calibration parameters from a user-configurable area

0: Load calibration parameters from the default area

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2190:02 | Save Calibration Parameters | UINT16 | RW | 0x0000 (0dec) |

1: Save calibration parameters to a user-configurable area

## 3.5.2 AMAX-4820: 4-Channel Analog Output Module

### 3.5.2.1 Object Dictionary Configuration

### Analog Output Enabled

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2180:01 | AO 0 Output Enabled | UINT16 | RW | 0x0000 (0dec) |
| 2181:01 | AO 1 Output Enabled | UINT16 | RW | 0x0000 (0dec) |
| 2182:01 | AO 2 Output Enabled | UINT16 | RW | 0x0000 (0dec) |
| 2183:01 | AO 3 Output Enabled | UINT16 | RW | 0x0000 (0dec) |

0: Output disabled

1: Output enabled

### Analog Output Range

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2180:02 | AO 0 Range Configuration | UINT16 | RW | 0x0000 (0dec) |
| 2181:02 | AO 1 Range Configuration | UINT16 | RW | 0x0000 (0dec) |
| 2182:02 | AO 2 Range Configuration | UINT16 | RW | 0x0000 (0dec) |
| 2183:02 | AO 3 Range Configuration | UINT16 | RW | 0x0000 (0dec) |

0: 0 ~ 5 V

1: 0 ~ 10 V

2: ±5 V

3: ±10 V

4: 0 ~ 20 mA

5: 4 ~ 20 mA

### Analog Output Data (PDO)

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 7000:01 | AO 0 | UINT16 | RW P | 0x0000 (0dec) |
| 7000:02 | AO 1 | UINT16 | RW P | 0x0000 (0dec) |
| 7000:03 | AO 2 | UINT16 | RW P | 0x0000 (0dec) |
| 7000:04 | AO 3 | UINT16 | RW P | 0x0000 (0dec) |

For the 0 ~ 5 V range

$$V_{OUT} = \frac{CODE}{2^{16}} \times 5V$$

For the 0 ~ 10 V range

$$V_{OUT} = \frac{CODE}{2^{16}} \times 10V$$

For the ±5 V range

$$V_{OUT} = \left(\frac{CODE}{2^{16}} \times 10V\right) - 5V$$

For the ±10 V range

$$V_{OUT} = \left(\frac{CODE}{2^{16}} \times 20V\right) - 10V$$

For the 0 ~ 20 mA range

$$I_{OUT} = \frac{CODE}{2^{16}} \times 20mA$$

For the 4 ~ 20 mA range:

$$I_{OUT} = \left(\frac{CODE}{2^{16}} \times 16mA\right) + 4mA$$

### Calibration Parameters

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2180:03 | AO 0 Offset Calibration Parameters | UINT16 | RW | 0x0000 (0dec) |
| 2180:04 | AO 0 Gain Calibration Parameters | UINT16 | RW | 0x8000 (32768dec) |
| 2181:03 | AO 1 Offset Calibration Parameters | UINT16 | RW | 0x0000 (0dec) |
| 2181:04 | AO 1 Gain Calibration Parameters | UINT16 | RW | 0x8000 (32768dec) |
| 2182:03 | AO 2 Offset Calibration Parameters | UINT16 | RW | 0x0000 (0dec) |
| 2182:04 | AO 2 Gain Calibration Parameters | UINT16 | RW | 0x8000 (32768dec) |
| 2183:03 | AO 3 Offset Calibration Parameters | UINT16 | RW | 0x0000 (0dec) |
| 2183:04 | AO 3 Gain Calibration Parameter | UINT16 | RW | 0x8000 (32768dec) |

$$CODE_CAL = CODE \times \left(\frac{GainPar + 2^{15}}{2^{16}}\right) + OffsetPar$$

***Note!*** *The offset calibration parameters are in 2's complement format. See the following table for further details.*

| Code | Value |
|---|---|
| 0x7FFF | +32767 |
| 0x7FFE | +32766 |
| 0x0002 | +2 |
| 0x0001 | +1 |
| 0x0000 | 0 |
| 0xFFFF | -1 |
| 0xFFFE | -2 |
| 0x8001 | -32767 |
| 0x8000 | -32768 |

- **Load/Save Calibration Parameters**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2190:01 | Load Calibration Parameters | UINT16 | RW | 0x0000 (0dec) |

1: Load calibration parameters from a user-configurable area

0: Load calibration parameters from the default area

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 2190:02 | Save Calibration Parameters | UINT16 | RW | 0x0000 (0dec) |

1: Save calibration parameters to a user-configurable area

### 3.5.2.2 Instruction Flow

- **Start Outputting Voltage/Current**

1. Set output range (Index 218x:02)
2. Set output value (Index 7000)
3. Enable output (Index 218x:01)

- **Change Output Range**

1. Disable output (Index 218x:01)
2. Set output range (Index 218x:02)
3. Set output value (Index 7000)
4. Enable output (Index 218x:01)

#### 3.5.2.3 Calibration Flow

1. Disable the AO channel to be calibrated.
2. Connect a DMM with a resolution of at least 6.5 bits to the AO channel.
3. Set the range and enable the AO channel.
4. Set AO data to 0x0040.
5. If the reading of the DMM is outside the “Offset Value” range shown in the following table, adjust the “AO n Offset Calibration Parameter” until the DMM reading falls within the “Offset Value” range. If the reading is too low, increase the “AO n Offset Calibration Parameter” and vice versa.
6. Set AO data to 0xFFC0.
7. If the reading of the DMM is outside the “Gain Value” range shown in the following table, adjust the “AO n Gain Calibration Parameter” until the DMM reading of falls within the “Gain Value” range. If the reading is too low, increase the “AO n Gain Calibration Parameter” and vice versa.
8. Set AO data to 0x0040.
9. If the reading of the DMM is outside the “Offset Value” range shown in the following table, return to Step 5. Otherwise, the calibration for this range of the AO channel is complete.

| Range | Offset Value | Gain Value |
|---|---|---|
| 0 ~ 5 V | 0.00481 ~ 0.00496 V | 4.9950 ~ 4.9952 V |
| 0 ~ 10 V | 0.00961 ~ 0.00992 V | 9.9901 ~ 9.9904 V |
| ±5 V | -4.9904 ~ -4.9901 V | 4.9901 ~ 4.9904 V |
| ±10 V | -9.9808 ~ -9.9802 V | 9.9802 ~ 9.9808 V |
| 0 ~ 20 mA | 0.0192 ~ 0.0198 mA | 19.9802 ~ 19.9808 mA |
| 4 ~ 20 mA | 4.0154 ~ 4.0158 mA | 19.9872 ~ 19.9876 mA |

## 3.5.3 AMAX-4830/SO: 16-Channel IDI and 16-Channel IDO Module

### 3.5.3.1 Object Dictionary Configuration

- **Digital Input Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 6000:01 | DI 0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI 1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI 2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI 3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI 4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI 5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI 6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI 7 | BOOLEAN | RO P | FALSE |
| 6001:01 | DI 8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI 9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI 10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI 11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI 12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI 13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI 14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI 15 | BOOLEAN | RO P | FALSE |

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

- **Digital Output Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 7000:01 | DO 0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO 1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO 2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO 3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO 4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO 5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO 6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO 7 | BOOLEAN | RW P | FALSE |
| 7001:01 | DO 8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO 9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO 10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO 11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO 12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO 13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO 14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO 15 | BOOLEAN | RW P | FALSE |

TRUE: Turn ON the digital output channel.

FALSE: Turn OFF the digital output channel.

## 3.5.4 AMAX-4833: 32-Channel IDI Module

### 3.5.4.1 Object Dictionary Configuration

■ **Digital Input Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 6000:01 | DI 0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI 1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI 2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI 3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI 4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI 5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI 6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI 7 | BOOLEAN | RO P | FALSE |
| 6001:01 | DI 8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI 9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI 10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI 11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI 12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI 13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI 14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI 15 | BOOLEAN | RO P | FALSE |
| 6002:01 | DI 16 | BOOLEAN | RO P | FALSE |
| 6002:02 | DI 17 | BOOLEAN | RO P | FALSE |
| 6002:03 | DI 18 | BOOLEAN | RO P | FALSE |
| 6002:04 | DI 19 | BOOLEAN | RO P | FALSE |
| 6002:05 | DI 20 | BOOLEAN | RO P | FALSE |
| 6002:06 | DI 21 | BOOLEAN | RO P | FALSE |
| 6002:07 | DI 22 | BOOLEAN | RO P | FALSE |
| 6002:08 | DI 23 | BOOLEAN | RO P | FALSE |
| 6003:01 | DI 24 | BOOLEAN | RO P | FALSE |
| 6003:02 | DI 25 | BOOLEAN | RO P | FALSE |
| 6003:03 | DI 26 | BOOLEAN | RO P | FALSE |
| 6003:04 | DI 27 | BOOLEAN | RO P | FALSE |
| 6003:05 | DI 28 | BOOLEAN | RO P | FALSE |
| 6003:06 | DI 29 | BOOLEAN | RO P | FALSE |
| 6003:07 | DI 30 | BOOLEAN | RO P | FALSE |
| 6003:08 | DI 31 | BOOLEAN | RO P | FALSE |

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

## 3.5.5 AMAX-4834: 32-Channel IDO Module

### 3.5.5.1 Object Dictionary Configuration

- **Digital Output Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 7000:01 | DO 0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO 1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO 2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO 3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO 4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO 5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO 6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO 7 | BOOLEAN | RW P | FALSE |
| 7001:01 | DO 8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO 9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO 10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO 11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO 12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO 13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO 14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO 15 | BOOLEAN | RW P | FALSE |
| 7002:01 | DO 16 | BOOLEAN | RW P | FALSE |
| 7002:02 | DO 17 | BOOLEAN | RW P | FALSE |
| 7002:03 | DO 18 | BOOLEAN | RW P | FALSE |
| 7002:04 | DO 19 | BOOLEAN | RW P | FALSE |
| 7002:05 | DO 20 | BOOLEAN | RW P | FALSE |
| 7002:06 | DO 21 | BOOLEAN | RW P | FALSE |
| 7002:07 | DO 22 | BOOLEAN | RW P | FALSE |
| 7002:08 | DO 23 | BOOLEAN | RW P | FALSE |
| 7003:01 | DO 24 | BOOLEAN | RW P | FALSE |
| 7003:02 | DO 25 | BOOLEAN | RW P | FALSE |
| 7003:03 | DO 26 | BOOLEAN | RW P | FALSE |
| 7003:04 | DO 27 | BOOLEAN | RW P | FALSE |
| 7003:05 | DO 28 | BOOLEAN | RW P | FALSE |
| 7003:06 | DO 29 | BOOLEAN | RW P | FALSE |
| 7003:07 | DO 30 | BOOLEAN | RW P | FALSE |
| 7003:08 | DO 31 | BOOLEAN | RW P | FALSE |

TRUE: Turn ON the digital output channel.

FALSE: Turn OFF the digital output channel.

## 3.5.6 AMAX-4850: 16-Channel IDI and 8-Channel PhotoMOS Output Module

### 3.5.6.1 Object Dictionary Configuration

■ **Digital Input Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 6000:01 | DI 0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI 1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI 2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI 3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI 4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI 5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI 6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI 7 | BOOLEAN | RO P | FALSE |
| 6001:01 | DI 8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI 9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI 10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI 11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI 12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI 13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI 14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI 15 | BOOLEAN | RO P | FALSE |

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

■ **PhotoMOS Output Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 7000:01 | DO 0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO 1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO 2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO 3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO 4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO 5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO 6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO 7 | BOOLEAN | RW P | FALSE |

TRUE: Turn ON the photoMOS channel.

FALSE: Turn OFF the photoMOS channel.

## 3.5.7 AMAX-4855: 32-Channel IDI and 16-Channel PhotoMOS Output Module

### 3.5.7.1 Object Dictionary Configuration

- **Digital Input Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 6000:01 | DI 0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI 1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI 2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI 3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI 4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI 5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI 6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI 7 | BOOLEAN | RO P | FALSE |
| 6001:01 | DI 8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI 9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI 10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI 11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI 12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI 13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI 14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI 15 | BOOLEAN | RO P | FALSE |
| 6002:01 | DI 16 | BOOLEAN | RO P | FALSE |
| 6002:02 | DI 17 | BOOLEAN | RO P | FALSE |
| 6002:03 | DI 18 | BOOLEAN | RO P | FALSE |
| 6002:04 | DI 19 | BOOLEAN | RO P | FALSE |
| 6002:05 | DI 20 | BOOLEAN | RO P | FALSE |
| 6002:06 | DI 21 | BOOLEAN | RO P | FALSE |
| 6002:07 | DI 22 | BOOLEAN | RO P | FALSE |
| 6002:08 | DI 23 | BOOLEAN | RO P | FALSE |
| 6003:01 | DI 24 | BOOLEAN | RO P | FALSE |
| 6003:02 | DI 25 | BOOLEAN | RO P | FALSE |
| 6003:03 | DI 26 | BOOLEAN | RO P | FALSE |
| 6003:04 | DI 27 | BOOLEAN | RO P | FALSE |
| 6003:05 | DI 28 | BOOLEAN | RO P | FALSE |
| 6003:06 | DI 29 | BOOLEAN | RO P | FALSE |
| 6003:07 | DI 30 | BOOLEAN | RO P | FALSE |
| 6003:08 | DI 31 | BOOLEAN | RO P | FALSE |

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

### 3.5.7.2 PhotoMOS Output Data (PDO)

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 7000:01 | DO 0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO 1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO 2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO 3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO 4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO 5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO 6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO 7 | BOOLEAN | RW P | FALSE |
| 7001:01 | DO 8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO 9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO 10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO 11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO 12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO 13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO 14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO 15 | BOOLEAN | RW P | FALSE |

TRUE: Turn ON the photoMOS channel.

FALSE: Turn OFF the photoMOS channel.

## 3.5.8 AMAX-4856: 32-Channel IDI and 32-Channel IDO Module

### 3.5.8.1 Object Dictionary Configuration

- **Digital Input Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 6000:01 | DI 0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI 1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI 2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI 3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI 4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI 5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI 6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI 7 | BOOLEAN | RO P | FALSE |
| 6001:01 | DI 8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI 9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI 10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI 11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI 12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI 13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI 14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI 15 | BOOLEAN | RO P | FALSE |
| 6002:01 | DI 16 | BOOLEAN | RO P | FALSE |
| 6002:02 | DI 17 | BOOLEAN | RO P | FALSE |
| 6002:03 | DI 18 | BOOLEAN | RO P | FALSE |
| 6002:04 | DI 19 | BOOLEAN | RO P | FALSE |
| 6002:05 | DI 20 | BOOLEAN | RO P | FALSE |
| 6002:06 | DI 21 | BOOLEAN | RO P | FALSE |
| 6002:07 | DI 22 | BOOLEAN | RO P | FALSE |
| 6002:08 | DI 23 | BOOLEAN | RO P | FALSE |
| 6003:01 | DI 24 | BOOLEAN | RO P | FALSE |
| 6003:02 | DI 25 | BOOLEAN | RO P | FALSE |
| 6003:03 | DI 26 | BOOLEAN | RO P | FALSE |
| 6003:04 | DI 27 | BOOLEAN | RO P | FALSE |
| 6003:05 | DI 28 | BOOLEAN | RO P | FALSE |
| 6003:06 | DI 29 | BOOLEAN | RO P | FALSE |
| 6003:07 | DI 30 | BOOLEAN | RO P | FALSE |
| 6003:08 | DI 31 | BOOLEAN | RO P | FALSE |

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

### Digital Output Data (PDO)

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 7000:01 | DO 0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO 1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO 2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO 3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO 4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO 5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO 6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO 7 | BOOLEAN | RW P | FALSE |
| 7001:01 | DO 8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO 9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO 10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO 11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO 12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO 13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO 14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO 15 | BOOLEAN | RW P | FALSE |
| 7002:01 | DO 16 | BOOLEAN | RW P | FALSE |
| 7002:02 | DO 17 | BOOLEAN | RW P | FALSE |
| 7002:03 | DO 18 | BOOLEAN | RW P | FALSE |
| 7002:04 | DO 19 | BOOLEAN | RW P | FALSE |
| 7002:05 | DO 20 | BOOLEAN | RW P | FALSE |
| 7002:06 | DO 21 | BOOLEAN | RW P | FALSE |
| 7002:07 | DO 22 | BOOLEAN | RW P | FALSE |
| 7002:08 | DO 23 | BOOLEAN | RW P | FALSE |
| 7003:01 | DO 24 | BOOLEAN | RW P | FALSE |
| 7003:02 | DO 25 | BOOLEAN | RW P | FALSE |
| 7003:03 | DO 26 | BOOLEAN | RW P | FALSE |
| 7003:04 | DO 27 | BOOLEAN | RW P | FALSE |
| 7003:05 | DO 28 | BOOLEAN | RW P | FALSE |
| 7003:06 | DO 29 | BOOLEAN | RW P | FALSE |
| 7003:07 | DO 30 | BOOLEAN | RW P | FALSE |
| 7003:08 | DO 31 | BOOLEAN | RW P | FALSE |

TRUE: Turn ON the digital output channel.

FALSE: Turn OFF the digital output channel.

## 3.5.9 AMAX-4860: 8-Channel IDI and 8-Channel Relay Output Module

### 3.5.9.1 Object Dictionary Configuration

- **Digital Input Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 6000:01 | DI 0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI 1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI 2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI 3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI 4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI 5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI 6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI 7 | BOOLEAN | RO P | FALSE |

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

- **Relay Output Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 7000:01 | DO 0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO 1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO 2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO 3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO 4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO 5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO 6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO 7 | BOOLEAN | RW P | FALSE |

TRUE: Turn ON the relay channel.

FALSE: Turn OFF the relay channel.

## 3.5.10 AMAX-4862: 16-Channel IDI and 16-Channel Relay Output Module

### 3.5.10.1 Object Dictionary Configuration

■ **Digital Input Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 6000:01 | DI 0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI 1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI 2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI 3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI 4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI 5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI 6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI 7 | BOOLEAN | RO P | FALSE |
| 6001:01 | DI 8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI 9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI 10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI 11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI 12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI 13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI 14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI 15 | BOOLEAN | RO P | FALSE |

TRUE: The digital input channel is ON.

FALSE: The digital input channel is OFF.

■ **Relay Output Data (PDO)**

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 7000:01 | DO 0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO 1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO 2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO 3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO 4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO 5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO 6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO 7 | BOOLEAN | RW P | FALSE |
| 7001:01 | DO 8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO 9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO 10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO 11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO 12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO 13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO 14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO 15 | BOOLEAN | RW P | FALSE |

TRUE: Turn ON the relay channel.

FALSE: Turn OFF the relay channel.

# Appendix A

## Object Dictionary

# A.1 Object Dictionary

## A.1.1 AMAX-4817 Object Dictionary

| **Standard Object (0x1000-0x1FFF)** | | | | |
|---|---|---|---|---|
| | | | | |
| **Index 1000 Device Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| **Index 1008 Device Name** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4817 |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | The hardware version of the module |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | The firmware version of the module |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004817 (18455dec) |
| 1018:03 | Revision Number | UInt32 | RO | 0x00000000 (0dec) |
| 1018:04 | Serial Number | UInt32 | RO | 0x00000000 (0dec) |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |

| **Index 1600 RxPDO Mapping** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x01 (1dec) |
| 1600:01 | Dummy Output 0 | UInt32 | RO | 0x7000:01, 16 |
| | | | | |
| **Index 1A00 TxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1A00:00 | TxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1A00:01 | AI 0 | UInt32 | RO | 0x6000:01, 16 |
| 1A00:02 | AI 1 | UInt32 | RO | 0x6000:02, 16 |
| 1A00:03 | AI 2 | UInt32 | RO | 0x6000:03, 16 |
| 1A00:04 | AI 3 | UInt32 | RO | 0x6000:04, 16 |
| 1A00:05 | AI 4 | UInt32 | RO | 0x6000:05, 16 |
| 1A00:06 | AI 5 | UInt32 | RO | 0x6000:06, 16 |
| 1A00:07 | AI 6 | UInt32 | RO | 0x6000:07, 16 |
| 1A00:08 | AI 7 | UInt32 | RO | 0x6000:08, 16 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0001 (1dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| | | | | |
| **Index 1C13 TxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0001 (1dec) |
| 1C13:01 | First Entry | UInt16 | RO | 0x1A00 (6656dec) |
| | | | | |
| **Index 1C32 SM Output Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |

| | | | | |
|---|---|---|---|---|
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Standard Object (0x2000-0x2FFF)** | | | | |
| | | | | |
| **Index 2180-2187 AO Configuration** | | | | |
| Index | Name | Data Type | Flags | Default |
| 2180:00 | AI 0 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2180:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2180:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2180:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2181:00 | AI 1 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2181:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2181:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2181:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2182:00 | AI 2 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2182:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2182:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |

| | | | | |
|---|---|---|---|---|
| 2182:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2183:00 | AI 3 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2183:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2183:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2183:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2184:00 | AI 4 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2184:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2184:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2184:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2185:00 | AI 5 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2185:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2185:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2185:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2186:00 | AI 6 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2186:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2186:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2186:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2187:00 | AI 7 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2187:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2187:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2187:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| | | | | |
| **Index 2190 Load/Save Calibration Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 2190:00 | Load/Save Calibration Parameter | UInt8 | RO | 0x02 (2dec) |
| 2190:01 | Load Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2190:02 | Save Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| | | | | |
| **Standard Object (0x6000-0x7FFF)** | | | | |
| | | | | |
| **Index 6000 Analog Input** | | | | |
| Index | Name | Data Type | Flags | Default |
| 6000:00 | Analog Input | UInt8 | RO P | 0x08 (8dec) |
| 6000:01 | AI 0 | UInt16 | RO P | 0x0000 (0dec) |
| 6000:02 | AI 1 | UInt16 | RO P | 0x0000 (0dec) |

| | | | | |
|---|---|---|---|---|
| 6000:03 | AI 2 | UInt16 | RO P | 0x0000 (0dec) |
| 6000:04 | AI 3 | UInt16 | RO P | 0x0000 (0dec) |
| 6000:05 | AI 4 | UInt16 | RO P | 0x0000 (0dec) |
| 6000:06 | AI 5 | UInt16 | RO P | 0x0000 (0dec) |
| 6000:07 | AI 6 | UInt16 | RO P | 0x0000 (0dec) |
| 6000:08 | AI 7 | UInt16 | RO P | 0x0000 (0dec) |
| | | | | |
| **Index 7000 Dummy Output** | | | | |
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Dummy Output | UInt8 | RW P | 0x01 (1dec) |
| 7000:01 | Dummy Output 0 | UInt8 | RW P | 0x00 (0dec) |

### A.1.2 AMAX-4820 Object Dictionary

| | | | | |
|---|---|---|---|---|
| **Standard Object (0x1000-0x1FFF)** | | | | |
| | | | | |
| **Index 1000 Device Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| **Index 1008 Device Name** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4820 |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | The hardware version of the module |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | The firmware version of the module |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004820 (18464dec) |
| 1018:03 | Revision Number | UInt32 | RO | 0x00000000 (0dec) |
| 1018:04 | Serial Number | UInt32 | RO | 0x00000000 (0dec) |

| | | | | |
|---|---|---|---|---|
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x04 (4dec) |
| 1600:01 | AO 0 | UInt32 | RO | 0x7000:01, 16 |
| 1600:02 | AO 1 | UInt32 | RO | 0x7000:02, 16 |
| 1600:03 | AO 2 | UInt32 | RO | 0x7000:03, 16 |
| 1600:04 | AO 3 | UInt32 | RO | 0x7000:04, 16 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0001 (1dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| | | | | |
| **Index 1C13 TxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| **Index 1C32 SM Output Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |

| | | | | |
|---|---|---|---|---|
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Standard Object (0x2000-0x2FFF)** | | | | |
| | | | | |
| **Index 2180-2183 AO Configuration** | | | | |
| Index | Name | Data Type | Flags | Default |
| 2180:00 | AO 0 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2180:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2180:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2180:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2181:00 | AO 1 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2181:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2181:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2181:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2182:00 | AO 2 Configuration | UInt8 | RO | 0x03 (3dec) |
| 2182:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2182:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2182:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| 2183:00 | AO 3 Configuration | UInt8 | RO | 0x03 (3dec) |

| | | | | |
|---|---|---|---|---|
| 2183:01 | Range | UInt16 | RW | 0x0000 (0dec) |
| 2183:02 | Offset Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2183:03 | Gain Calibration Parameter | UInt16 | RW | 0x8000 (32768dec) |
| | | | | |
| **Index 2190 Load/Save Calibration Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 2190:00 | Load/Save Calibration Parameter | UInt8 | RO | 0x02 (2dec) |
| 2190:01 | Load Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| 2190:02 | Save Calibration Parameter | UInt16 | RW | 0x0000 (0dec) |
| | | | | |
| **Standard Object (0x6000-0x7FFF)** | | | | |
| | | | | |
| **Index 7000 Analog Output** | | | | |
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Analog Output | UInt8 | RW P | 0x04 (4dec) |
| 7000:01 | AO 0 | UInt16 | RW P | 0x0000 (0dec) |
| 7000:02 | AO 1 | UInt16 | RW P | 0x0000 (0dec) |
| 7000:03 | AO 2 | UInt16 | RW P | 0x0000 (0dec) |
| 7000:04 | AO 3 | UInt16 | RW P | 0x0000 (0dec) |

## A.1.3 AMAX-4830/SO Object Dictionary

### A.1.3.1 Standard Object (0x1000-0x1FFF)

| | | | | |
|---|---|---|---|---|
| **Index 1000 Device Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| **Index 1008 Device Name** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4830 or AMAX-4830SO |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | The hardware version of the module |
| | | | | |

| Index 100A Software Version | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | The firmware version of the module |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004830 (18480dec) |
| 1018:03 | Revision Number | UInt32 | RO | The revision number of the module |
| 1018:04 | Serial Number | UInt32 | RO | The serial number of the module |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600-1601 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1600:01 | DO0 | UInt32 | RO | 0x7000:01, 1 |
| 1600:02 | DO1 | UInt32 | RO | 0x7000:02, 1 |
| 1600:03 | DO2 | UInt32 | RO | 0x7000:03, 1 |
| 1600:04 | DO3 | UInt32 | RO | 0x7000:04, 1 |
| 1600:05 | DO4 | UInt32 | RO | 0x7000:05, 1 |
| 1600:06 | DO5 | UInt32 | RO | 0x7000:06, 1 |
| 1600:07 | DO6 | UInt32 | RO | 0x7000:07, 1 |
| 1600:08 | DO7 | UInt32 | RO | 0x7000:08, 1 |
| 1601:00 | RxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1601:01 | DO8 | UInt32 | RO | 0x7001:01, 1 |
| 1601:02 | DO9 | UInt32 | RO | 0x7001:02, 1 |
| 1601:03 | DO10 | UInt32 | RO | 0x7001:03, 1 |
| 1601:04 | DO11 | UInt32 | RO | 0x7001:04, 1 |
| 1601:05 | DO12 | UInt32 | RO | 0x7001:05, 1 |
| 1601:06 | DO13 | UInt32 | RO | 0x7001:06, 1 |
| 1601:07 | DO14 | UInt32 | RO | 0x7001:07, 1 |
| 1601:08 | DO15 | UInt32 | RO | 0x7001:08, 1 |

| **Index 1A00-1A01 TxPDO Mapping** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1A00:00 | TxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1A00:01 | DI0 | UInt32 | RO | 0x6000:01, 1 |
| 1A00:02 | DI1 | UInt32 | RO | 0x6000:02, 1 |
| 1A00:03 | DI2 | UInt32 | RO | 0x6000:03, 1 |
| 1A00:04 | DI3 | UInt32 | RO | 0x6000:04, 1 |
| 1A00:05 | DI4 | UInt32 | RO | 0x6000:05, 1 |
| 1A00:06 | DI5 | UInt32 | RO | 0x6000:06, 1 |
| 1A00:07 | DI6 | UInt32 | RO | 0x6000:07, 1 |
| 1A00:08 | DI7 | UInt32 | RO | 0x6000:08, 1 |
| 1A01:00 | TxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1A01:01 | DI8 | UInt32 | RO | 0x6001:01, 1 |
| 1A01:02 | DI9 | UInt32 | RO | 0x6001:02, 1 |
| 1A01:03 | DI10 | UInt32 | RO | 0x6001:03, 1 |
| 1A01:04 | DI11 | UInt32 | RO | 0x6001:04, 1 |
| 1A01:05 | DI12 | UInt32 | RO | 0x6001:05, 1 |
| 1A01:06 | DI13 | UInt32 | RO | 0x6001:06, 1 |
| 1A01:07 | DI14 | UInt32 | RO | 0x6001:07, 1 |
| 1A01:08 | DI15 | UInt32 | RO | 0x6001:08, 1 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0002 (2dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| 1C12:02 | Second Entry | UInt16 | RO | 0x1601 (5633dec) |
| | | | | |
| **Index 1C13 TxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0002 (2dec) |
| 1C13:01 | First Entry | UInt16 | RO | 0x1A00 (6656dec) |
| 1C13:02 | Second Entry | UInt16 | RO | 0x1A01 (6657dec) |
| | | | | |
| **Index 1C32 SM Output Parameter** | | | | |

| Index | Name | Data Type | Flags | Default |
|---|---|---|---|---|
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |

### A.1.3.2 Standard Object (0x6000-0x7FFF)

| **Index 6000-6001 Digital Input Port** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 6000:00 | Digital Input Port 0 | UInt8 | RO P | 0x08 (8dec) |
| 6000:01 | DI0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI7 | BOOLEAN | RO P | FALSE |
| 6001:00 | Digital Input Port 1 | UInt8 | RO P | 0x08 (8dec) |
| 6001:01 | DI8 | BOOLEAN | RO P | FALSE |

| | | | | |
|---|---|---|---|---|
| 6001:02 | DI9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI15 | BOOLEAN | RO P | FALSE |
| | | | | |
| **Index 7000-7001 Digital Output Port** | | | | |
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Digital Output Port 0 | UInt8 | RW P | 0x08 (8dec) |
| 7000:01 | DO0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO7 | BOOLEAN | RW P | FALSE |
| 7001:00 | Digital Output Port 1 | UInt8 | RW P | 0x08 (8dec) |
| 7001:01 | DO8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO15 | BOOLEAN | RW P | FALSE |

## A.1.4 AMAX-4833 Object Dictionary

### A.1.4.1 Standard Object (0x1000-0x1FFF)

| | | | | |
|---|---|---|---|---|
| **Index 1000 Device Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| **Index 1008 Device Name** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4833 |
| | | | | |

| Index 1009 Hardware Version | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | The hardware version of the module |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | The firmware version of the module |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004833 (18483dec) |
| 1018:03 | Revision Number | UInt32 | RO | The revision number of the module |
| 1018:04 | Serial Number | UInt32 | RO | The serial number of the module |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600-1601 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x01 (1dec) |
| 1600:01 | Dummy Output 0 | UInt32 | RO | 0x7000:01, 1 |
| 1A00:02 | DI1 | UInt32 | RO | 0x6000:02, 1 |
| 1A00:03 | DI2 | UInt32 | RO | 0x6000:03, 1 |
| 1A00:04 | DI3 | UInt32 | RO | 0x6000:04, 1 |
| 1A00:05 | DI4 | UInt32 | RO | 0x6000:05, 1 |
| 1A00:06 | DI5 | UInt32 | RO | 0x6000:06, 1 |
| 1A00:07 | DI6 | UInt32 | RO | 0x6000:07, 1 |
| 1A00:08 | DI7 | UInt32 | RO | 0x6000:08, 1 |
| 1A01:00 | TxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1A01:01 | DI8 | UInt32 | RO | 0x6001:01, 1 |
| 1A01:02 | DI9 | UInt32 | RO | 0x6001:02, 1 |
| 1A01:03 | DI10 | UInt32 | RO | 0x6001:03, 1 |
| 1A01:04 | DI11 | UInt32 | RO | 0x6001:04, 1 |
| 1A01:05 | DI12 | UInt32 | RO | 0x6001:05, 1 |
| 1A01:06 | DI13 | UInt32 | RO | 0x6001:06, 1 |
| 1A01:07 | DI14 | UInt32 | RO | 0x6001:07, 1 |

| | | | | |
|---|---|---|---|---|
| 1A01:08 | DI15 | UInt32 | RO | 0x6001:08, 1 |
| 1A02:00 | TxPDO Mapping 2 | UInt8 | RO | 0x08 (8dec) |
| 1A02:01 | DI16 | UInt32 | RO | 0x6002:01, 1 |
| 1A02:02 | DI17 | UInt32 | RO | 0x6002:02, 1 |
| 1A02:03 | DI18 | UInt32 | RO | 0x6002:03, 1 |
| 1A02:04 | DI19 | UInt32 | RO | 0x6002:04, 1 |
| 1A02:05 | DI20 | UInt32 | RO | 0x6002:05, 1 |
| 1A02:06 | DI21 | UInt32 | RO | 0x6002:06, 1 |
| 1A02:07 | DI22 | UInt32 | RO | 0x6002:07, 1 |
| 1A02:08 | DI23 | UInt32 | RO | 0x6002:08, 1 |
| 1A03:00 | TxPDO Mapping 3 | UInt8 | RO | 0x08 (8dec) |
| 1A03:01 | DI24 | UInt32 | RO | 0x6003:01, 1 |
| 1A03:02 | DI25 | UInt32 | RO | 0x6003:02, 1 |
| 1A03:03 | DI26 | UInt32 | RO | 0x6003:03, 1 |
| 1A03:04 | DI27 | UInt32 | RO | 0x6003:04, 1 |
| 1A03:05 | DI28 | UInt32 | RO | 0x6003:05, 1 |
| 1A03:06 | DI29 | UInt32 | RO | 0x6003:06, 1 |
| 1A03:07 | DI30 | UInt32 | RO | 0x6003:07, 1 |
| 1A03:08 | DI31 | UInt32 | RO | 0x6003:08, 1 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0001 (1dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| | | | | |
| **Index 1C13 TxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0004 (4dec) |
| 1C13:01 | First Entry | UInt16 | RO | 0x1A00 (6656dec) |
| 1C13:02 | Second Entry | UInt16 | RO | 0x1A01 (6657dec) |
| 1C13:03 | Third Entry | UInt16 | RO | 0x1A02 (6658dec) |
| 1C13:04 | Fourth Entry | UInt16 | RO | 0x1A03 (6659dec) |
| | | | | |

| Index 1C32 SM Output Parameter | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |

| Index 6000-6003 Digital Input Port | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 6000:00 | Digital Input Port 0 | UInt8 | RO P | 0x08 (8dec) |
| 6000:01 | DI0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI7 | BOOLEAN | RO P | FALSE |
| 6001:00 | Digital Input Port 1 | UInt8 | RO P | 0x08 (8dec) |
| 6001:01 | DI8 | BOOLEAN | RO P | FALSE |

| | | | | |
|---|---|---|---|---|
| 6001:02 | DI9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI15 | BOOLEAN | RO P | FALSE |
| 6002:00 | Digital Input Port 2 | UInt8 | RO P | 0x08 (8dec) |
| 6002:01 | DI16 | BOOLEAN | RO P | FALSE |
| 6002:02 | DI17 | BOOLEAN | RO P | FALSE |
| 6002:03 | DI18 | BOOLEAN | RO P | FALSE |
| 6002:04 | DI19 | BOOLEAN | RO P | FALSE |
| 6002:05 | DI20 | BOOLEAN | RO P | FALSE |
| 6002:06 | DI21 | BOOLEAN | RO P | FALSE |
| 6002:07 | DI22 | BOOLEAN | RO P | FALSE |
| 6002:08 | DI23 | BOOLEAN | RO P | FALSE |
| 6003:00 | Digital Input Port 3 | UInt8 | RO P | 0x08 (8dec) |
| 6003:01 | DI24 | BOOLEAN | RO P | FALSE |
| 6003:02 | DI25 | BOOLEAN | RO P | FALSE |
| 6003:03 | DI26 | BOOLEAN | RO P | FALSE |
| 6003:04 | DI27 | BOOLEAN | RO P | FALSE |
| 6003:05 | DI28 | BOOLEAN | RO P | FALSE |
| 6003:06 | DI29 | BOOLEAN | RO P | FALSE |
| 6003:07 | DI30 | BOOLEAN | RO P | FALSE |
| 6003:08 | DI31 | BOOLEAN | RO P | FALSE |
| | | | | |
| **Index 7000 Dummy Output** | | | | |
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Dummy Output | UInt8 | RW P | 0x01 (1dec) |
| 7000:01 | Dummy Output 0 | BOOLEAN | RW P | FALSE |

## A.1.5 AMAX-4834 Object Dictionary

### A.1.5.1 Standard Object (0x1000-0x1FFF)

| **Index 1000 Device Type** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |

| **Index 1008 Device Name** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4834 |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | The hardware version of the module |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | The firmware version of the module |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004834 (18484dec) |
| 1018:03 | Revision Number | UInt32 | RO | The revision number of the module |
| 1018:04 | Serial Number | UInt32 | RO | The serial number of the module |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600-1601 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1600:01 | DO0 | UInt32 | RO | 0x7000:01, 1 |
| 1600:02 | DO1 | UInt32 | RO | 0x7000:02, 1 |
| 1600:03 | DO2 | UInt32 | RO | 0x7000:03, 1 |
| 1600:04 | DO3 | UInt32 | RO | 0x7000:04, 1 |
| 1600:05 | DO4 | UInt32 | RO | 0x7000:05, 1 |
| 1600:06 | DO5 | UInt32 | RO | 0x7000:06, 1 |
| 1600:07 | DO6 | UInt32 | RO | 0x7000:07, 1 |
| 1600:08 | DO7 | UInt32 | RO | 0x7000:08, 1 |
| 1601:00 | RxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1601:01 | DO8 | UInt32 | RO | 0x7001:01, 1 |
| 1601:02 | DO9 | UInt32 | RO | 0x7001:02, 1 |
| 1601:03 | DO10 | UInt32 | RO | 0x7001:03, 1 |
| 1601:04 | DO11 | UInt32 | RO | 0x7001:04, 1 |

| | | | | |
|---|---|---|---|---|
| 1601:05 | DO12 | UInt32 | RO | 0x7001:05, 1 |
| 1601:06 | DO13 | UInt32 | RO | 0x7001:06, 1 |
| 1601:07 | DO14 | UInt32 | RO | 0x7001:07, 1 |
| 1601:08 | DO15 | UInt32 | RO | 0x7001:08, 1 |
| 1602:00 | RxPDO Mapping 2 | UInt8 | RO | 0x08 (8dec) |
| 1602:01 | DO16 | UInt32 | RO | 0x7002:01, 1 |
| 1602:02 | DO17 | UInt32 | RO | 0x7002:02, 1 |
| 1602:03 | DO18 | UInt32 | RO | 0x7002:03, 1 |
| 1602:04 | DO19 | UInt32 | RO | 0x7002:04, 1 |
| 1602:05 | DO20 | UInt32 | RO | 0x7002:05, 1 |
| 1602:06 | DO21 | UInt32 | RO | 0x7002:06, 1 |
| 1602:07 | DO22 | UInt32 | RO | 0x7002:07, 1 |
| 1602:08 | DO23 | UInt32 | RO | 0x7002:08, 1 |
| 1603:00 | RxPDO Mapping 3 | UInt8 | RO | 0x08 (8dec) |
| 1603:01 | DO24 | UInt32 | RO | 0x7003:01, 1 |
| 1603:02 | DO25 | UInt32 | RO | 0x7003:02, 1 |
| 1603:03 | DO26 | UInt32 | RO | 0x7003:03, 1 |
| 1603:04 | DO27 | UInt32 | RO | 0x7003:04, 1 |
| 1603:05 | DO28 | UInt32 | RO | 0x7003:05, 1 |
| 1603:06 | DO29 | UInt32 | RO | 0x7003:06, 1 |
| 1603:07 | DO30 | UInt32 | RO | 0x7003:07, 1 |
| 1603:08 | DO31 | UInt32 | RO | 0x7003:08, 1 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0004 (4dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| 1C12:02 | Second Entry | UInt16 | RO | 0x1601 (5633dec) |
| 1C12:03 | Third Entry | UInt16 | RO | 0x1602 (5634dec) |
| 1C12:04 | Fourth Entry | UInt16 | RO | 0x1603 (5635dec) |
| | | | | |
| **Index 1C13 TxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0000 (0dec) |

| | | | | |
|---|---|---|---|---|
| **Index 1C32 SM Output Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |

### A.1.5.2 Standard Object (0x6000-0x7FFF)

| **Index 7000-7003 Digital Output Port** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Digital Output Port 0 | UInt8 | RW P | 0x08 (8dec) |
| 7000:01 | DO0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO5 | BOOLEAN | RW P | FALSE |

| | | | | |
|---|---|---|---|---|
| 7000:07 | DO6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO7 | BOOLEAN | RW P | FALSE |
| 7001:00 | Digital Output Port 1 | UInt8 | RW P | 0x08 (8dec) |
| 7001:01 | DO8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO15 | BOOLEAN | RW P | FALSE |
| 7002:00 | Digital Output Port 2 | UInt8 | RW P | 0x08 (8dec) |
| 7002:01 | DO16 | BOOLEAN | RW P | FALSE |
| 7002:02 | DO17 | BOOLEAN | RW P | FALSE |
| 7002:03 | DO18 | BOOLEAN | RW P | FALSE |
| 7002:04 | DO19 | BOOLEAN | RW P | FALSE |
| 7002:05 | DO20 | BOOLEAN | RW P | FALSE |
| 7002:06 | DO21 | BOOLEAN | RW P | FALSE |
| 7002:07 | DO22 | BOOLEAN | RW P | FALSE |
| 7002:08 | DO23 | BOOLEAN | RW P | FALSE |
| 7003:00 | Digital Output Port 3 | UInt8 | RW P | 0x08 (8dec) |
| 7003:01 | DO24 | BOOLEAN | RW P | FALSE |
| 7003:02 | DO25 | BOOLEAN | RW P | FALSE |
| 7003:03 | DO26 | BOOLEAN | RW P | FALSE |
| 7003:04 | DO27 | BOOLEAN | RW P | FALSE |
| 7003:05 | DO28 | BOOLEAN | RW P | FALSE |
| 7003:06 | DO29 | BOOLEAN | RW P | FALSE |
| 7003:07 | DO30 | BOOLEAN | RW P | FALSE |
| 7003:08 | DO31 | BOOLEAN | RW P | FALSE |

## A.1.6 AMAX-4850 Object Dictionary

### A.1.6.1 Standard Object (0x1000-0x1FFF)

| **Index 1000 Device Type** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |

| **Index 1008 Device Name** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4850 |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | The hardware version of the module |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | The firmware version of the module |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004850 (18512dec) |
| 1018:03 | Revision Number | UInt32 | RO | The revision number of the module |
| 1018:04 | Serial Number | UInt32 | RO | The serial number of the module |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1600:01 | DO0 | UInt32 | RO | 0x7000:01, 1 |
| 1600:02 | DO1 | UInt32 | RO | 0x7000:02, 1 |
| 1600:03 | DO2 | UInt32 | RO | 0x7000:03, 1 |
| 1600:04 | DO3 | UInt32 | RO | 0x7000:04, 1 |
| 1600:05 | DO4 | UInt32 | RO | 0x7000:05, 1 |
| 1600:06 | DO5 | UInt32 | RO | 0x7000:06, 1 |
| 1600:07 | DO6 | UInt32 | RO | 0x7000:07, 1 |
| 1600:08 | DO7 | UInt32 | RO | 0x7000:08, 1 |
| | | | | |
| **Index 1A00-1A01 TxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1A00:00 | TxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |

| | | | | |
|---|---|---|---|---|
| 1A00:01 | DI0 | UInt32 | RO | 0x6000:01, 1 |
| 1A00:02 | DI1 | UInt32 | RO | 0x6000:02, 1 |
| 1A00:03 | DI2 | UInt32 | RO | 0x6000:03, 1 |
| 1A00:04 | DI3 | UInt32 | RO | 0x6000:04, 1 |
| 1A00:05 | DI4 | UInt32 | RO | 0x6000:05, 1 |
| 1A00:06 | DI5 | UInt32 | RO | 0x6000:06, 1 |
| 1A00:07 | DI6 | UInt32 | RO | 0x6000:07, 1 |
| 1A00:08 | DI7 | UInt32 | RO | 0x6000:08, 1 |
| 1A01:00 | TxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1A01:01 | DI8 | UInt32 | RO | 0x6001:01, 1 |
| 1A01:02 | DI9 | UInt32 | RO | 0x6001:02, 1 |
| 1A01:03 | DI10 | UInt32 | RO | 0x6001:03, 1 |
| 1A01:04 | DI11 | UInt32 | RO | 0x6001:04, 1 |
| 1A01:05 | DI12 | UInt32 | RO | 0x6001:05, 1 |
| 1A01:06 | DI13 | UInt32 | RO | 0x6001:06, 1 |
| 1A01:07 | DI14 | UInt32 | RO | 0x6001:07, 1 |
| 1A01:08 | DI15 | UInt32 | RO | 0x6001:08, 1 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0001 (1dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| | | | | |
| **Index 1C13 TxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0002 (2dec) |
| 1C13:01 | First Entry | UInt16 | RO | 0x1A00 (6656dec) |
| 1C13:02 | Second Entry | UInt16 | RO | 0x1A01 (6657dec) |
| | | | | |
| **Index 1C32 SM Output Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |

| | | | | |
|---|---|---|---|---|
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |

### A.1.6.2 Standard Object (0x6000-0x7FFF)

| **Index 6000-6001 Digital Input Port** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 6000:00 | Digital Input Port 0 | UInt8 | RO P | 0x08 (8dec) |
| 6000:01 | DI0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI7 | BOOLEAN | RO P | FALSE |
| 6001:00 | Digital Input Port 1 | UInt8 | RO P | 0x08 (8dec) |
| 6001:01 | DI8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI11 | BOOLEAN | RO P | FALSE |

| | | | | |
|---|---|---|---|---|
| 6001:05 | DI12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI15 | BOOLEAN | RO P | FALSE |
| | | | | |
| **Index 7000 Digital Output Port** | | | | |
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Digital Output Port 0 | UInt8 | RW P | 0x08 (8dec) |
| 7000:01 | DO0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO7 | BOOLEAN | RW P | FALSE |

### A.1.7 AMAX-4855 Object Dictionary

| | | | | |
|---|---|---|---|---|
| **Standard Object (0x1000-0x1FFF)** | | | | |
| | | | | |
| **Index 1000 Device Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| **Index 1008 Device Name** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4855 |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | Dependent |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | Dependent |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |

| | | | | |
|---|---|---|---|---|
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004855 (18517dec) |
| 1018:03 | Revision Number | UInt32 | RO | 0x00000000 (0dec) |
| 1018:04 | Serial Number | UInt32 | RO | 0x00000000 (0dec) |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600-1601 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1600:01 | DO0 | UInt32 | RO | 0x7000:01, 1 |
| 1600:02 | DO1 | UInt32 | RO | 0x7000:02, 1 |
| 1600:03 | DO2 | UInt32 | RO | 0x7000:03, 1 |
| 1600:04 | DO3 | UInt32 | RO | 0x7000:04, 1 |
| 1600:05 | DO4 | UInt32 | RO | 0x7000:05, 1 |
| 1600:06 | DO5 | UInt32 | RO | 0x7000:06, 1 |
| 1600:07 | DO6 | UInt32 | RO | 0x7000:07, 1 |
| 1600:08 | DO7 | UInt32 | RO | 0x7000:08, 1 |
| 1601:00 | RxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1601:01 | DO8 | UInt32 | RO | 0x7001:01, 1 |
| 1601:02 | DO9 | UInt32 | RO | 0x7001:02, 1 |
| 1601:03 | DO10 | UInt32 | RO | 0x7001:03, 1 |
| 1601:04 | DO11 | UInt32 | RO | 0x7001:04, 1 |
| 1601:05 | DO12 | UInt32 | RO | 0x7001:05, 1 |
| 1601:06 | DO13 | UInt32 | RO | 0x7001:06, 1 |
| 1601:07 | DO14 | UInt32 | RO | 0x7001:07, 1 |
| 1601:08 | DO15 | UInt32 | RO | 0x7001:08, 1 |
| | | | | |
| **Index 1A00-1A03 TxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1A00:00 | TxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1A00:01 | DI0 | UInt32 | RO | 0x6000:01, 1 |
| 1A00:02 | DI1 | UInt32 | RO | 0x6000:02, 1 |
| 1A00:03 | DI2 | UInt32 | RO | 0x6000:03, 1 |
| 1A00:04 | DI3 | UInt32 | RO | 0x6000:04, 1 |
| 1A00:05 | DI4 | UInt32 | RO | 0x6000:05, 1 |
| 1A00:06 | DI5 | UInt32 | RO | 0x6000:06, 1 |
| 1A00:07 | DI6 | UInt32 | RO | 0x6000:07, 1 |
| 1A00:08 | DI7 | UInt32 | RO | 0x6000:08, 1 |
| 1A01:00 | TxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |

| | | | | |
|---|---|---|---|---|
| 1A01:01 | DI8 | UInt32 | RO | 0x6001:01, 1 |
| 1A01:02 | DI9 | UInt32 | RO | 0x6001:02, 1 |
| 1A01:03 | DI10 | UInt32 | RO | 0x6001:03, 1 |
| 1A01:04 | DI11 | UInt32 | RO | 0x6001:04, 1 |
| 1A01:05 | DI12 | UInt32 | RO | 0x6001:05, 1 |
| 1A01:06 | DI13 | UInt32 | RO | 0x6001:06, 1 |
| 1A01:07 | DI14 | UInt32 | RO | 0x6001:07, 1 |
| 1A01:08 | DI15 | UInt32 | RO | 0x6001:08, 1 |
| 1A02:00 | TxPDO Mapping 2 | UInt8 | RO | 0x08 (8dec) |
| 1A02:01 | DI16 | UInt32 | RO | 0x6002:01, 1 |
| 1A02:02 | DI17 | UInt32 | RO | 0x6002:02, 1 |
| 1A02:03 | DI18 | UInt32 | RO | 0x6002:03, 1 |
| 1A02:04 | DI19 | UInt32 | RO | 0x6002:04, 1 |
| 1A02:05 | DI20 | UInt32 | RO | 0x6002:05, 1 |
| 1A02:06 | DI21 | UInt32 | RO | 0x6002:06, 1 |
| 1A02:07 | DI22 | UInt32 | RO | 0x6002:07, 1 |
| 1A02:08 | DI23 | UInt32 | RO | 0x6002:08, 1 |
| 1A03:00 | TxPDO Mapping 3 | UInt8 | RO | 0x08 (8dec) |
| 1A03:01 | DI24 | UInt32 | RO | 0x6003:01, 1 |
| 1A03:02 | DI25 | UInt32 | RO | 0x6003:02, 1 |
| 1A03:03 | DI26 | UInt32 | RO | 0x6002:03, 1 |
| 1A03:04 | DI27 | UInt32 | RO | 0x6003:04, 1 |
| 1A03:05 | DI28 | UInt32 | RO | 0x6003:05, 1 |
| 1A03:06 | DI29 | UInt32 | RO | 0x6003:06, 1 |
| 1A03:07 | DI30 | UInt32 | RO | 0x6003:07, 1 |
| 1A03:08 | DI31 | UInt32 | RO | 0x6003:08, 1 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0002 (2dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| 1C12:02 | Second Entry | UInt16 | RO | 0x1601 (5633dec) |
| | | | | |

| Index 1C13 TxPDO Assignment | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0004 (4dec) |
| 1C13:01 | First Entry | UInt16 | RO | 0x1A00 (6656dec) |
| 1C13:02 | Second Entry | UInt16 | RO | 0x1A01 (6657dec) |
| 1C13:03 | Third Entry | UInt16 | RO | 0x1A02 (6658dec) |
| 1C13:04 | Fourth Entry | UInt16 | RO | 0x1A03 (6659dec) |
| | | | | |
| **Index 1C32 SM Output Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Standard Object (0x6000-0x7FFF)** | | | | |
| | | | | |

| **Index 6000-6003 Digital Input Port** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 6000:00 | Digital Input Port 0 | UInt8 | RO P | 0x08 (8dec) |
| 6000:01 | DI0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI7 | BOOLEAN | RO P | FALSE |
| 6001:00 | Digital Input Port 1 | UInt8 | RO P | 0x08 (8dec) |
| 6001:01 | DI8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI15 | BOOLEAN | RO P | FALSE |
| 6002:00 | Digital Input Port 2 | UInt8 | RO P | 0x08 (8dec) |
| 6002:01 | DI16 | BOOLEAN | RO P | FALSE |
| 6002:02 | DI17 | BOOLEAN | RO P | FALSE |
| 6002:03 | DI18 | BOOLEAN | RO P | FALSE |
| 6002:04 | DI19 | BOOLEAN | RO P | FALSE |
| 6002:05 | DI20 | BOOLEAN | RO P | FALSE |
| 6002:06 | DI21 | BOOLEAN | RO P | FALSE |
| 6002:07 | DI22 | BOOLEAN | RO P | FALSE |
| 6002:08 | DI23 | BOOLEAN | RO P | FALSE |
| 6003:00 | Digital Input Port 3 | UInt8 | RO P | 0x08 (8dec) |
| 6003:01 | DI24 | BOOLEAN | RO P | FALSE |
| 6003:02 | DI25 | BOOLEAN | RO P | FALSE |
| 6003:03 | DI26 | BOOLEAN | RO P | FALSE |
| 6003:04 | DI27 | BOOLEAN | RO P | FALSE |
| 6003:05 | DI28 | BOOLEAN | RO P | FALSE |
| 6003:06 | DI29 | BOOLEAN | RO P | FALSE |
| 6003:07 | DI30 | BOOLEAN | RO P | FALSE |
| 6003:08 | DI31 | BOOLEAN | RO P | FALSE |
| | | | | |
| **Index 7000-7001 Digital Output Port** | | | | |
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Digital Output Port 0 | UInt8 | RW P | 0x08 (8dec) |
| 7000:01 | DO0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO1 | BOOLEAN | RW P | FALSE |

| | | | | |
|---|---|---|---|---|
| 7000:03 | DO2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO7 | BOOLEAN | RW P | FALSE |
| 7001:00 | Digital Output Port 1 | UInt8 | RW P | 0x08 (8dec) |
| 7001:01 | DO8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO15 | BOOLEAN | RW P | FALSE |

### A.1.8 AMAX-4856 Object Dictionary

| **Standard Object (0x1000-0x1FFF)** | | | | |
|---|---|---|---|---|
| | | | | |
| **Index 1000 Device Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| **Index 1008 Device Name** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4856 |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | Dependent |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | Dependent |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |

| | | | | |
|---|---|---|---|---|
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004856 (18518dec) |
| 1018:03 | Revision Number | UInt32 | RO | 0x00000000 (0dec) |
| 1018:04 | Serial Number | UInt32 | RO | 0x00000000 (0dec) |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600-1603 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1600:01 | DO0 | UInt32 | RO | 0x7000:01, 1 |
| 1600:02 | DO1 | UInt32 | RO | 0x7000:02, 1 |
| 1600:03 | DO2 | UInt32 | RO | 0x7000:03, 1 |
| 1600:04 | DO3 | UInt32 | RO | 0x7000:04, 1 |
| 1600:05 | DO4 | UInt32 | RO | 0x7000:05, 1 |
| 1600:06 | DO5 | UInt32 | RO | 0x7000:06, 1 |
| 1600:07 | DO6 | UInt32 | RO | 0x7000:07, 1 |
| 1600:08 | DO7 | UInt32 | RO | 0x7000:08, 1 |
| 1601:00 | RxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1601:01 | DO8 | UInt32 | RO | 0x7001:01, 1 |
| 1601:02 | DO9 | UInt32 | RO | 0x7001:02, 1 |
| 1601:03 | DO10 | UInt32 | RO | 0x7001:03, 1 |
| 1601:04 | DO11 | UInt32 | RO | 0x7001:04, 1 |
| 1601:05 | DO12 | UInt32 | RO | 0x7001:05, 1 |
| 1601:06 | DO13 | UInt32 | RO | 0x7001:06, 1 |
| 1601:07 | DO14 | UInt32 | RO | 0x7001:07, 1 |
| 1601:08 | DO15 | UInt32 | RO | 0x7001:08, 1 |
| 1602:00 | RxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1602:01 | DO16 | UInt32 | RO | 0x7002:01, 1 |
| 1602:02 | DO17 | UInt32 | RO | 0x7002:02, 1 |
| 1602:03 | DO18 | UInt32 | RO | 0x7002:03, 1 |
| 1602:04 | DO19 | UInt32 | RO | 0x7002:04, 1 |
| 1602:05 | DO20 | UInt32 | RO | 0x7002:05, 1 |
| 1602:06 | DO21 | UInt32 | RO | 0x7002:06, 1 |
| 1602:07 | DO22 | UInt32 | RO | 0x7002:07, 1 |
| 1602:08 | DO23 | UInt32 | RO | 0x7002:08, 1 |
| 1603:00 | RxPDO Mapping 2 | UInt8 | RO | 0x08 (8dec) |
| 1603:01 | DO24 | UInt32 | RO | 0x7003:01, 1 |
| 1603:02 | DO25 | UInt32 | RO | 0x7003:02, 1 |
| 1603:03 | DO26 | UInt32 | RO | 0x7003:03, 1 |

| | | | | |
|---|---|---|---|---|
| 1603:04 | DO27 | UInt32 | RO | 0x7003:04, 1 |
| 1603:05 | DO28 | UInt32 | RO | 0x7003:05, 1 |
| 1603:06 | DO29 | UInt32 | RO | 0x7003:06, 1 |
| 1603:07 | DO30 | UInt32 | RO | 0x7003:07, 1 |
| 1603:08 | DO31 | UInt32 | RO | 0x7003:08, 1 |
| | | | | |
| **Index 1A00-1A03 TxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1A00:00 | TxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1A00:01 | DI0 | UInt32 | RO | 0x6000:01, 1 |
| 1A00:02 | DI1 | UInt32 | RO | 0x6000:02, 1 |
| 1A00:03 | DI2 | UInt32 | RO | 0x6000:03, 1 |
| 1A00:04 | DI3 | UInt32 | RO | 0x6000:04, 1 |
| 1A00:05 | DI4 | UInt32 | RO | 0x6000:05, 1 |
| 1A00:06 | DI5 | UInt32 | RO | 0x6000:06, 1 |
| 1A00:07 | DI6 | UInt32 | RO | 0x6000:07, 1 |
| 1A00:08 | DI7 | UInt32 | RO | 0x6000:08, 1 |
| 1A01:00 | TxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1A01:01 | DI8 | UInt32 | RO | 0x6001:01, 1 |
| 1A01:02 | DI9 | UInt32 | RO | 0x6001:02, 1 |
| 1A01:03 | DI10 | UInt32 | RO | 0x6001:03, 1 |
| 1A01:04 | DI11 | UInt32 | RO | 0x6001:04, 1 |
| 1A01:05 | DI12 | UInt32 | RO | 0x6001:05, 1 |
| 1A01:06 | DI13 | UInt32 | RO | 0x6001:06, 1 |
| 1A01:07 | DI14 | UInt32 | RO | 0x6001:07, 1 |
| 1A01:08 | DI15 | UInt32 | RO | 0x6001:08, 1 |
| 1A02:00 | TxPDO Mapping 2 | UInt8 | RO | 0x08 (8dec) |
| 1A02:01 | DI16 | UInt32 | RO | 0x6002:01, 1 |
| 1A02:02 | DI17 | UInt32 | RO | 0x6002:02, 1 |
| 1A02:03 | DI18 | UInt32 | RO | 0x6002:03, 1 |
| 1A02:04 | DI19 | UInt32 | RO | 0x6002:04, 1 |
| 1A02:05 | DI20 | UInt32 | RO | 0x6002:05, 1 |
| 1A02:06 | DI21 | UInt32 | RO | 0x6002:06, 1 |
| 1A02:07 | DI22 | UInt32 | RO | 0x6002:07, 1 |
| 1A02:08 | DI23 | UInt32 | RO | 0x6002:08, 1 |
| 1A03:00 | TxPDO Mapping 3 | UInt8 | RO | 0x08 (8dec) |
| 1A03:01 | DI24 | UInt32 | RO | 0x6003:01, 1 |
| 1A03:02 | DI25 | UInt32 | RO | 0x6003:02, 1 |
| 1A03:03 | DI26 | UInt32 | RO | 0x6003:03, 1 |
| 1A03:04 | DI27 | UInt32 | RO | 0x6003:04, 1 |
| 1A03:05 | DI28 | UInt32 | RO | 0x6003:05, 1 |
| 1A03:06 | DI29 | UInt32 | RO | 0x6003:06, 1 |
| 1A03:07 | DI30 | UInt32 | RO | 0x6003:07, 1 |
| 1A03:08 | DI31 | UInt32 | RO | 0x6003:08, 1 |
| | | | | |

| **Index 1C00 Sync Manager Type** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0004 (4dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| 1C12:02 | Second Entry | UInt16 | RO | 0x1601 (5633dec) |
| 1C12:03 | Third Entry | UInt16 | RO | 0x1602 (5634dec) |
| 1C12:04 | Fourth Entry | UInt16 | RO | 0x1603 (5635dec) |
| | | | | |
| **Index 1C13 TxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0004 (4dec) |
| 1C13:01 | First Entry | UInt16 | RO | 0x1A00 (6656dec) |
| 1C13:02 | Second Entry | UInt16 | RO | 0x1A01 (6657dec) |
| 1C13:03 | Third Entry | UInt16 | RO | 0x1A02 (6658dec) |
| 1C13:04 | Fourth Entry | UInt16 | RO | 0x1A03 (6659dec) |
| | | | | |
| **Index 1C32 SM Output Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |

| Index 1C33 SM Input Parameter | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |

**Standard Object (0x6000-0x7FFF)**

| Index 6000-6003 Digital Input Port | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 6000:00 | Digital Input Port 0 | UInt8 | RO P | 0x08 (8dec) |
| 6000:01 | DI0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI7 | BOOLEAN | RO P | FALSE |
| 6001:00 | Digital Input Port 1 | UInt8 | RO P | 0x08 (8dec) |
| 6001:01 | DI8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI15 | BOOLEAN | RO P | FALSE |
| 6002:00 | Digital Input Port 2 | UInt8 | RO P | 0x08 (8dec) |
| 6002:01 | DI16 | BOOLEAN | RO P | FALSE |
| 6002:02 | DI17 | BOOLEAN | RO P | FALSE |
| 6002:03 | DI18 | BOOLEAN | RO P | FALSE |
| 6002:04 | DI19 | BOOLEAN | RO P | FALSE |
| 6002:05 | DI20 | BOOLEAN | RO P | FALSE |
| 6002:06 | DI21 | BOOLEAN | RO P | FALSE |

| | | | | |
|---|---|---|---|---|
| 6002:07 | DI22 | BOOLEAN | RO P | FALSE |
| 6002:08 | DI23 | BOOLEAN | RO P | FALSE |
| 6003:00 | Digital Input Port 3 | UInt8 | RO P | 0x08 (8dec) |
| 6003:01 | DI24 | BOOLEAN | RO P | FALSE |
| 6003:02 | DI25 | BOOLEAN | RO P | FALSE |
| 6003:03 | DI26 | BOOLEAN | RO P | FALSE |
| 6003:04 | DI27 | BOOLEAN | RO P | FALSE |
| 6003:05 | DI28 | BOOLEAN | RO P | FALSE |
| 6003:06 | DI29 | BOOLEAN | RO P | FALSE |
| 6003:07 | DI30 | BOOLEAN | RO P | FALSE |
| 6003:08 | DI31 | BOOLEAN | RO P | FALSE |
| | | | | |
| **Index 7000-7003 Digital Output Port** | | | | |
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Digital Output Port 0 | UInt8 | RW P | 0x08 (8dec) |
| 7000:01 | DO0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO7 | BOOLEAN | RW P | FALSE |
| 7001:00 | Digital Output Port 1 | UInt8 | RW P | 0x08 (8dec) |
| 7001:01 | DO8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO15 | BOOLEAN | RW P | FALSE |
| 7002:00 | Digital Output Port 2 | UInt8 | RW P | 0x08 (8dec) |
| 7002:01 | DO16 | BOOLEAN | RW P | FALSE |
| 7002:02 | DO17 | BOOLEAN | RW P | FALSE |
| 7002:03 | DO18 | BOOLEAN | RW P | FALSE |
| 7002:04 | DO19 | BOOLEAN | RW P | FALSE |
| 7002:05 | DO20 | BOOLEAN | RW P | FALSE |
| 7002:06 | DO21 | BOOLEAN | RW P | FALSE |
| 7002:07 | DO22 | BOOLEAN | RW P | FALSE |
| 7002:08 | DO23 | BOOLEAN | RW P | FALSE |
| 7003:00 | Digital Output Port 3 | UInt8 | RW P | 0x08 (8dec) |
| 7003:01 | DO24 | BOOLEAN | RW P | FALSE |
| 7003:02 | DO25 | BOOLEAN | RW P | FALSE |
| 7003:03 | DO26 | BOOLEAN | RW P | FALSE |

| | | | | |
|---|---|---|---|---|
| 7003:04 | DO27 | BOOLEAN | RW P | FALSE |
| 7003:05 | DO28 | BOOLEAN | RW P | FALSE |
| 7003:06 | DO29 | BOOLEAN | RW P | FALSE |
| 7003:07 | DO30 | BOOLEAN | RW P | FALSE |
| 7003:08 | DO31 | BOOLEAN | RW P | FALSE |

## A.1.9 AMAX-4860 Object Dictionary

### A.1.9.1 Standard Object (0x1000-0x1FFF)

| **Index 1000 Device Type** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| **Index 1008 Device Name** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4860 |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | The hardware version of the module |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | The firmware version of the module |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004860 (18528dec) |
| 1018:03 | Revision Number | UInt32 | RO | The revision number of the module |
| 1018:04 | Serial Number | UInt32 | RO | The serial number of the module |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |

| | | | | |
|---|---|---|---|---|
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1600:01 | DO0 | UInt32 | RO | 0x7000:01, 1 |
| 1600:02 | DO1 | UInt32 | RO | 0x7000:02, 1 |
| 1600:03 | DO2 | UInt32 | RO | 0x7000:03, 1 |
| 1600:04 | DO3 | UInt32 | RO | 0x7000:04, 1 |
| 1600:05 | DO4 | UInt32 | RO | 0x7000:05, 1 |
| 1600:06 | DO5 | UInt32 | RO | 0x7000:06, 1 |
| 1600:07 | DO6 | UInt32 | RO | 0x7000:07, 1 |
| 1600:08 | DO7 | UInt32 | RO | 0x7000:08, 1 |
| | | | | |
| **Index 1A00 TxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1A00:00 | TxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1A00:01 | DI0 | UInt32 | RO | 0x6000:01, 1 |
| 1A00:02 | DI1 | UInt32 | RO | 0x6000:02, 1 |
| 1A00:03 | DI2 | UInt32 | RO | 0x6000:03, 1 |
| 1A00:04 | DI3 | UInt32 | RO | 0x6000:04, 1 |
| 1A00:05 | DI4 | UInt32 | RO | 0x6000:05, 1 |
| 1A00:06 | DI5 | UInt32 | RO | 0x6000:06, 1 |
| 1A00:07 | DI6 | UInt32 | RO | 0x6000:07, 1 |
| 1A00:08 | DI7 | UInt32 | RO | 0x6000:08, 1 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0001 (1dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| | | | | |

| Index 1C13 TxPDO Assignment | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0001 (1dec) |
| 1C13:01 | First Entry | UInt16 | RO | 0x1A00 (6656dec) |
| | | | | |
| **Index 1C32 SM Output Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |

### A.1.9.2 Standard Object (0x6000-0x7FFF)

| Index 6000 Digital Input Port | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 6000:00 | Digital Input Port 0 | UInt8 | RO P | 0x08 (8dec) |
| 6000:01 | DI0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI3 | BOOLEAN | RO P | FALSE |

| | | | | |
|---|---|---|---|---|
| 6000:05 | DI4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI7 | BOOLEAN | RO P | FALSE |
| | | | | |
| **Index 7000 Digital Output Port** | | | | |
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Digital Output Port 0 | UInt8 | RW P | 0x08 (8dec) |
| 7000:01 | DO0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO7 | BOOLEAN | RW P | FALSE |

### A.1.10 AMAX-4862 Object Dictionary

| | | | | |
|---|---|---|---|---|
| **Standard Object (0x1000-0x1FFF)** | | | | |
| | | | | |
| Index 1000 Device Type | | | | |
| Index | Name | Data Type | Flags | Default |
| 1000:00 | Device Type | UInt32 | M RO | 0x00001389 (5001dec) |
| | | | | |
| **Index 1001 Error Register** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1001:00 | Error Register | UInt16 | RO | 0x0000 (0dec) |
| | | | | |
| Index 1008 Device Name | | | | |
| Index | Name | Data Type | Flags | Default |
| 1008:00 | Device Name | String | RO | AMAX-4862 |
| | | | | |
| **Index 1009 Hardware Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1009:00 | Hardware Version | String | RO | Dependent |
| | | | | |
| **Index 100A Software Version** | | | | |
| Index | Name | Data Type | Flags | Default |
| 100A:00 | Software Version | String | RO | Dependent |
| | | | | |
| **Index 1018 Identity Object** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1018:00 | Identity Object | UInt16 | RO | 0x0004 (4dec) |

| | | | | |
|---|---|---|---|---|
| 1018:01 | Vendor ID | UInt32 | RO | 0x000013FE (5118dec) |
| 1018:02 | Product Code | UInt32 | RO | 0x00004862 (18530dec) |
| 1018:03 | Revision Number | UInt32 | RO | 0x00000000 (0dec) |
| 1018:04 | Serial Number | UInt32 | RO | 0x00000000 (0dec) |
| | | | | |
| **Index 10F1 Error Settings** | | | | |
| Index | Name | Data Type | Flags | Default |
| 10F1:00 | Error Settings | UInt8 | RO | 0x02 (2dec) |
| 10F1:01 | Local Error Reaction | UInt32 | RW | 0x00000001 (1dec) |
| 10F1:02 | Sync Error Counter Limit | UInt32 | RW | 0x00000004 (4dec) |
| | | | | |
| **Index 1600-1601 RxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1600:00 | RxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1600:01 | DO0 | UInt32 | RO | 0x7000:01, 1 |
| 1600:02 | DO1 | UInt32 | RO | 0x7000:02, 1 |
| 1600:03 | DO2 | UInt32 | RO | 0x7000:03, 1 |
| 1600:04 | DO3 | UInt32 | RO | 0x7000:04, 1 |
| 1600:05 | DO4 | UInt32 | RO | 0x7000:05, 1 |
| 1600:06 | DO5 | UInt32 | RO | 0x7000:06, 1 |
| 1600:07 | DO6 | UInt32 | RO | 0x7000:07, 1 |
| 1600:08 | DO7 | UInt32 | RO | 0x7000:08, 1 |
| 1601:00 | RxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |
| 1601:01 | DO8 | UInt32 | RO | 0x7001:01, 1 |
| 1601:02 | DO9 | UInt32 | RO | 0x7001:02, 1 |
| 1601:03 | DO10 | UInt32 | RO | 0x7001:03, 1 |
| 1601:04 | DO11 | UInt32 | RO | 0x7001:04, 1 |
| 1601:05 | DO12 | UInt32 | RO | 0x7001:05, 1 |
| 1601:06 | DO13 | UInt32 | RO | 0x7001:06, 1 |
| 1601:07 | DO14 | UInt32 | RO | 0x7001:07, 1 |
| 1601:08 | DO15 | UInt32 | RO | 0x7001:08, 1 |
| | | | | |
| **Index 1A00-1A01 TxPDO Mapping** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1A00:00 | TxPDO Mapping 0 | UInt8 | RO | 0x08 (8dec) |
| 1A00:01 | DI0 | UInt32 | RO | 0x6000:01, 1 |
| 1A00:02 | DI1 | UInt32 | RO | 0x6000:02, 1 |
| 1A00:03 | DI2 | UInt32 | RO | 0x6000:03, 1 |
| 1A00:04 | DI3 | UInt32 | RO | 0x6000:04, 1 |
| 1A00:05 | DI4 | UInt32 | RO | 0x6000:05, 1 |
| 1A00:06 | DI5 | UInt32 | RO | 0x6000:06, 1 |
| 1A00:07 | DI6 | UInt32 | RO | 0x6000:07, 1 |
| 1A00:08 | DI7 | UInt32 | RO | 0x6000:08, 1 |
| 1A01:00 | TxPDO Mapping 1 | UInt8 | RO | 0x08 (8dec) |

| | | | | |
|---|---|---|---|---|
| 1A01:01 | DI8 | UInt32 | RO | 0x6001:01, 1 |
| 1A01:02 | DI9 | UInt32 | RO | 0x6001:02, 1 |
| 1A01:03 | DI10 | UInt32 | RO | 0x6001:03, 1 |
| 1A01:04 | DI11 | UInt32 | RO | 0x6001:04, 1 |
| 1A01:05 | DI12 | UInt32 | RO | 0x6001:05, 1 |
| 1A01:06 | DI13 | UInt32 | RO | 0x6001:06, 1 |
| 1A01:07 | DI14 | UInt32 | RO | 0x6001:07, 1 |
| 1A01:08 | DI15 | UInt32 | RO | 0x6001:08, 1 |
| | | | | |
| **Index 1C00 Sync Manager Type** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C00:00 | Sync Manager Type | UInt16 | RO | 0x0004 (4dec) |
| 1C00:01 | Communication Type Sync Manager 0 | UInt8 | RO | 0x01 (1dec) |
| 1C00:02 | Communication Type Sync Manager 1 | UInt8 | RO | 0x02 (2dec) |
| 1C00:03 | Communication Type Sync Manager 2 | UInt8 | RO | 0x03 (3dec) |
| 1C00:04 | Communication Type Sync Manager 3 | UInt8 | RO | 0x04 (4dec) |
| | | | | |
| **Index 1C12 RxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C12:00 | RxPDO Assignment | UInt16 | RO | 0x0002 (2dec) |
| 1C12:01 | First Entry | UInt16 | RO | 0x1600 (5632dec) |
| 1C12:02 | Second Entry | UInt16 | RO | 0x1601 (5633dec) |
| | | | | |
| **Index 1C13 TxPDO Assignment** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C13:00 | TxPDO Assignment | UInt16 | RO | 0x0002 (2dec) |
| 1C13:01 | First Entry | UInt16 | RO | 0x1A00 (6656dec) |
| 1C13:02 | Second Entry | UInt16 | RO | 0x1A01 (6657dec) |
| | | | | |
| **Index 1C32 SM Output Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C32:00 | SM Output Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C32:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C32:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C32:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C32:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C32:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C32:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C32:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C32:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |

| | | | | |
|---|---|---|---|---|
| 1C32:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C32:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Index 1C33 SM Input Parameter** | | | | |
| Index | Name | Data Type | Flags | Default |
| 1C33:00 | SM Input Parameter | UInt16 | RO | 0x0020 (32dec) |
| 1C33:01 | Synchronization Type | UInt16 | RO | 0x0001 (1dec) |
| 1C33:02 | Cycle Time | UInt32 | RO | Dependent |
| 1C33:04 | Synchronization Types Supported | UInt16 | RO | 0x401E (16414dec) |
| 1C33:05 | Minimum Cycle Time | UInt32 | RO | 0x000186A0 (100000dec) |
| 1C33:06 | Calc and Copy Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:08 | Get Cycle Time | UInt16 | RW | 0x0000 (0dec) |
| 1C33:09 | Delay Time | UInt32 | RO | 0x00000000 (0dec) |
| 1C33:0A | Sync0 Cycle Time | UInt32 | RW | 0x00000000 (0dec) |
| 1C33:0B | SM-Event Missed | UInt16 | RO | 0x0000 (0dec) |
| 1C33:0C | Cycle Time Too Small | UInt16 | RO | 0x0000 (0dec) |
| 1C33:20 | Sync Error | BOOLEAN | RO | FALSE |
| | | | | |
| **Standard Object (0x6000-0x7FFF)** | | | | |
| | | | | |
| **Index 6000-6001 Digital Input Port** | | | | |
| Index | Name | Data Type | Flags | Default |
| 6000:00 | Digital Input Port 0 | UInt8 | RO P | 0x08 (8dec) |
| 6000:01 | DI0 | BOOLEAN | RO P | FALSE |
| 6000:02 | DI1 | BOOLEAN | RO P | FALSE |
| 6000:03 | DI2 | BOOLEAN | RO P | FALSE |
| 6000:04 | DI3 | BOOLEAN | RO P | FALSE |
| 6000:05 | DI4 | BOOLEAN | RO P | FALSE |
| 6000:06 | DI5 | BOOLEAN | RO P | FALSE |
| 6000:07 | DI6 | BOOLEAN | RO P | FALSE |
| 6000:08 | DI7 | BOOLEAN | RO P | FALSE |
| 6001:00 | Digital Input Port 1 | UInt8 | RO P | 0x08 (8dec) |
| 6001:01 | DI8 | BOOLEAN | RO P | FALSE |
| 6001:02 | DI9 | BOOLEAN | RO P | FALSE |
| 6001:03 | DI10 | BOOLEAN | RO P | FALSE |
| 6001:04 | DI11 | BOOLEAN | RO P | FALSE |
| 6001:05 | DI12 | BOOLEAN | RO P | FALSE |
| 6001:06 | DI13 | BOOLEAN | RO P | FALSE |
| 6001:07 | DI14 | BOOLEAN | RO P | FALSE |
| 6001:08 | DI15 | BOOLEAN | RO P | FALSE |

| **Index 7000-7001 Digital Output Port** | | | | |
|---|---|---|---|---|
| Index | Name | Data Type | Flags | Default |
| 7000:00 | Digital Output Port 0 | UInt8 | RW P | 0x08 (8dec) |
| 7000:01 | DO0 | BOOLEAN | RW P | FALSE |
| 7000:02 | DO1 | BOOLEAN | RW P | FALSE |
| 7000:03 | DO2 | BOOLEAN | RW P | FALSE |
| 7000:04 | DO3 | BOOLEAN | RW P | FALSE |
| 7000:05 | DO4 | BOOLEAN | RW P | FALSE |
| 7000:06 | DO5 | BOOLEAN | RW P | FALSE |
| 7000:07 | DO6 | BOOLEAN | RW P | FALSE |
| 7000:08 | DO7 | BOOLEAN | RW P | FALSE |
| 7001:00 | Digital Output Port 1 | UInt8 | RW P | 0x08 (8dec) |
| 7001:01 | DO8 | BOOLEAN | RW P | FALSE |
| 7001:02 | DO9 | BOOLEAN | RW P | FALSE |
| 7001:03 | DO10 | BOOLEAN | RW P | FALSE |
| 7001:04 | DO11 | BOOLEAN | RW P | FALSE |
| 7001:05 | DO12 | BOOLEAN | RW P | FALSE |
| 7001:06 | DO13 | BOOLEAN | RW P | FALSE |
| 7001:07 | DO14 | BOOLEAN | RW P | FALSE |
| 7001:08 | DO15 | BOOLEAN | RW P | FALSE |

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